# The RUBBER AGE

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# *June Rubber Consumption Sets Record As Visible Stocks Decline*

## Rubber Used in the United States During First Half of 1928 Was 4.7 Per Cent More Than During Corresponding Period Last Year— London Stocks Less Than Month's Supply For U. S.

THE recent report of the Rubber Association of America on the record breaking consumption of crude rubber during the month of June has been the most encouraging news that has come from the rubber industry in the last six months and indicates, in a more graphic way than anything else which has transpired within the period, that the industry as a whole is in a healthy condition. The total amount of crude rubber absorbed by the industry in the United States in June totaled 37,676 tons.

This consumption of crude rubber during June represents a gain of approximately 1 per cent over the high figure for May which was 37,333 tons and an increase of 3,875 tons or 11.5 per cent over June, 1927. For the first six months of the current year the total consumption within the United States has climbed to 211,634 tons, an increase of 9,612 tons or 4.7 per cent over the corresponding period of 1927.

### *Rubber Imports Decline*

Coincident with the high rate of consumption, imports fell off perceptibly to 25,792 tons and marked the third consecutive month of declining shipments from the Far East. During May, arrivals totaled 32,883 tons while in June, 1927, imports were 33,194 tons. The total imports, moreover, for the first six months of the current year total only 212,497 as against 226,850 tons for the corresponding period of 1927.

As a consequence of the decline in imports, and again coincident with the record absorption by the industry, stocks on hand dropped from 105,356 tons on May 31st, to 90,189 tons on June 30. Stocks afloat to the United States showed a slight increase and totaled 40,001 tons as compared to 34,374 tons at the end of May. The increase, however, last month was due primarily to the movements from London to New York rather than any increase coming from the Far East. The total stocks on hand and afloat to the United States therefore totaled 130,190 tons at the end of June as compared with 139,730 tons recorded on May 31st.

Along with the increased use of crude rubber, there was however, a decline reported in the consumption of reclaimed rubber in June which totaled only 15,920 tons as compared with 17,746 tons in May. The decrease was not unexpected, in view of the comparatively low prevailing prices of crude rubber. With the reduction in tonnage used, the percentage to the amount of crude rubber consumed also registered a decline. The May figure represented 47.5 per cent of the crude rubber used that month while last month's ratio was 42.3 per cent.

The crude rubber situation during the last six weeks has undergone a most important and significant reversal, amounting to a condition almost paradoxical. Two months ago when the market first broke upon receipt of the news that all restrictive measures would be abolished by the British government as of November 1, the statistical position of crude rubber could have been said to have been top-heavy. Consumption in the United States, although high, had not reached expectations, stocks in London were still high and stocks in America had reached a record peak. Unseasonable weather had retarded tire sales and finished goods were not moving in satisfactory volume from the factories.

The last two months has seen a complete turn-around in the situation. The market has more or less stabilized around 19 cents. in spite of the bugaboo that lurks in the mind's-eye of rubber trading circles as to what heights accumulated stocks will climb between now and November 1. The manufacturing industry has taken a sudden spurt and for two successive months has consumed crude rubber at a rate which has broken all previous records in the history of the industry. Stocks in London have registered a drop each week and now total barely 36,000 tons, less than the requirements of the United States for last month alone, while the heavy consumption in America has reduced also the domestic stocks from the high level set in March of 114,000 tons to 90,189 tons as of June 30.

### *Malayan Shipments Below Quota*

Strange as it may appear, and in seeming contradiction to the belief that Malaya would begin producing and shipping larger quantities of crude rubber now that unlimited production on the estates will be permissible of exportation after November 1, the actual exports last month fell below even the shipments of the preceding month and well below the amount allowable under the still

## "DOMESTIC RUBBER SOON REALITY"---EDISON

Thomas A. Edison recently indicated that he was well satisfied with the experiments which he has been carrying on in the field of rubber research, when he made the statement at his East Orange, N. J., plant that "the manufacture of domestic rubber will soon be a reality." He did not elaborate on his remark, however, and it is not known from what source of supply he expects the rubber yield or whether his experiments with plants and weeds have been completed.

existing exportable quota of 60 per cent of the standard production. Just what significance this has is not easily determined. While it is probable that the prevailing low price of rubber is holding up some exports, it is hard to believe that the estates expect any real advance before November, at which time it is far more likely that the market will show a further decline rather than an improvement.

While the statistical position of crude rubber can thus be said to have improved, at least from the standpoint of trading circles, by the reduction of visible supplies, the situation has not been reflected in the price levels on the crude rubber market and since the drop to 17 cents in April the price for spot and nearby deliveries has settled around 19 cents, with very little fluctuation in the daily quotations between high and low extremes. This apparent stability in price levels has had the salutary effect of bringing factory interests back into the market to replenish their stocks at prices which are especially advantageous with the prevailing low prices of tires and finished rubber goods in general. It is interesting to note that in the face of this renewed demand there has been no concerted bullish trend in the market, a fact that clearly indicates the lack of confidence in the future positions on the part of traders generally. Any bullish trend has already had the effect of driving the buyers to cover and is also stopped by the traders themselves by their fear of what accumulations of stocks wait to be dumped upon the market on November 1.

### *Marketing Recommendations*

The tone of the British rubber trade journals indicates that the British rubber interests are now thoroughly reconciled to the abolition of restriction and the problem now is one of adjustment as quickly as possible to the changed conditions. The Rubber Growers' Association has transmitted a circular to all its members urging a distribution of all exportable rubber on hand at the estates as of October 31 over a period of six months rather than the dumping of the total amount of available stocks on hand into the market immediately upon the lifting of the bars. Strenuous efforts at recruiting further labor in order to bring estates up to full production are being taken throughout the restricted districts. More important still are the recommendations being made to keep costs, during the period of expansion, to the lowest possible minimum and the suggestions for tapping vigorously the best yielding trees in an effort to increase production with the least increase in cost.

While there is a persistent fear in crude rubber circles that probably things may get a trifle worse before they get better in manufacturing circles, in the United States at least, the belief is generally maintained that conditions have more or less reached rock-bottom, certainly as regards prices and raw material costs, and that the industry, after suffering heavy inventory losses and making adjustments, is now on the up-grade. While it is generally conceded that most of the manufacturing companies will show a severe decline in net earnings for the first half of the year, the drop in earnings, in the majority of cases, will not be sufficiently great to wipe out all profits and some of the companies are even expected to show fair returns after meeting all preferred dividend requirements. With the exception of a very few all the manufacturing companies are entering the second half year with good prospects for a satisfactory period, with low prices on raw materials and a good tire demand.

# *Institute Appoints Chairmen For Six Divisional Conferences*

## Troublesome Trade Practices in Different Parts of the Rubber Industry Will Be Discussed at Meetings and Recommendations Will Be Made Thereafter for Consideration By the Executive Committee

SEVERAL important steps in formulating the policies of the newly established Rubber Institute have already been taken by the board of directors, headed by Brigadier General Lincoln C. Andrews, as a result of the first two meetings recently held in Akron.

It was voted at one of the meetings that, for the present, there would be no standing committees of the Institute other than the Executive Committee and that the work of preparing recommendations on trade practices and distribution would be done by temporary advisory committees or conferences to be organized by and to work under the leadership of designated men in the industry, who would assemble the best informed men available. The recommendations reached by each conference or advisory committee would then be made to the Executive Committee for their consideration and determination. It was also determined that such conferences should be formed in the following divisions of the industry: Tires, Mechanical Goods, Footwear, Hard Rubber, Shoes and Heels and Sundries.

In accordance with the policy determined upon, steps have already been taken to hold numerous conferences among the representatives of the six classes of manufacturers enumerated above. The heads of these groups, in the order in which they were named above, are as follows: J. D. Tew, B. F. Goodrich Co.; A. F. Townsend, Manhattan Rubber Mfg. Co.; Homer E. Sawyer, U. S. Rubber Co.; E. S. Boyer, American Hard Rubber Co.; F. C. Hood, Hood Rubber Co.; Wm. F. Pfeiffer, Miller Rubber Co.

It is expected that a report on such rules as will be adopted by each group will be in the hands of the executive committee shortly. These will be made the basis of the permanent code of trade practices to be adopted by the Institute. Before these rules are finally determined upon by the Institute, however, it is planned to submit them to the Federal Trade Commission in Washington, which, in turn, will call a trade practice conference to which all interested parties will be invited. The results of this conference will more or less determine the official acceptability of the Institute's plans by the federal authorities, and the code as finally adopted will therefore have what might be considered official approval.

At the same time it is emphasized by General Andrews that in this way the code of rules ultimately adopted by the Institute will not have been, in any sense, imposed upon the industry, but will have come directly from the industry and the Institute will merely be acting in the role of the industry's spokesman.

At the meeting on July 6 at the home of H. S. Firestone, Sr., in Akron, a committee was named by General Andrews to study and report on the question of tire warranties. A tentative report of the committee is understood to have been submitted at the second meeting, also held at Mr. Firestone's home on July 13, but no announcement of the action on this report will be forthcoming from the Institute for some time. This subcommittee which made a study of tire mileage guarantees was composed as follows: L. C. Rockhill, sales manager of Miller Rubber & Tire Co.; L. R. Jackson, sales manager of Firestone Tire & Rubber Co.; Robert S. Wilson, vice-president and sales manager of Goodyear Tire & Rubber Co.; L. A. McQueen, sales manager of the B. F. Goodrich Co.; C. S. Dickey, of the Corduroy Tire & Rubber Co., Grand Rapids, Mich.; C. E. Murray, Jr., president of the Murray Rubber Co., of Trenton, N. J., and H. L. Post, vice-president of the Seiberling Tire & Rubber Co.

The office personnel of the Institute, which has its headquarters at 1776 Broadway, has not been enlarged in any important respect and the alterations of the permanent headquarters are still under way. Nor has the matter of the delineation of functions as between the Institute and the Rubber Association been fully and completely worked out.

It can be definitely said, however, that the Institute has begun its activities in a very determined way and executive action on several different policies involving the industry and the operations of the Institute, have been taken up under General Andrews' direction.

# Cooling Water for Use in Rubber Manufacturing Plants

## Some Details of the New Miller Installation in Akron—Cooling Tower Used Alone Many Months of the Year—Arguments For and Against Cooling Towers—Five Points to Bear Always in Mind

*By* W. F. SCHAPHORST, M.E.

IN connection with the complete electrification of its 35-acre factory in Akron, the Miller Rubber Company has within the last few months completed and put into operation what is said by engineers to be the largest refrigeration plant of its kind in the United States. This refrigeration unit was completed at a cost of about $300,000. There are more than ten miles of pipe connecting it with the machines in which the cooling water is needed. Among the machines in which cooling is required are 65 mills, 13 calenders, 8 Banbury mixers and six large tread tubers.

The Miller refrigeration plant is built in three units with a capacity of 300 tons of refrigeration for each unit.

Situated on a hill rather remote from the larger units of the factory, the cooling plant stands out as apart from the factory. With its tower on the top of the brick building 70 feet above the street level it can be seen from a great distance. The building is 50 feet wide by 150 feet long and houses also an electric substation which transforms current for the entire factory.

In the pump and compressor room, which is the largest room in the plant, there are three compressors with a capacity of 300 tons daily each. Two of the compressors are driven by rope belt drive with electric motor power and a third compressor is equipped with direct electric drive. Four large ammonia tanks each 20 feet long and eighteen inches in diameter furnish the ammonia storage for the compressors. About 4,000 pounds of ammonia are used during a year.

A battery of seven electrically driven centrifugal pumps, with a total capacity of 12,000 gallons of water a minute, pump the water to the mills in the factory and to the cooling tower on the top of the building. These pumps are driven by direct drive. Current for the operation of the refrigeration plant, as well as for the factory is furnished by the local power company from a hydro-electrical plant. The water for the factory is furnished by the city and wells on the property.

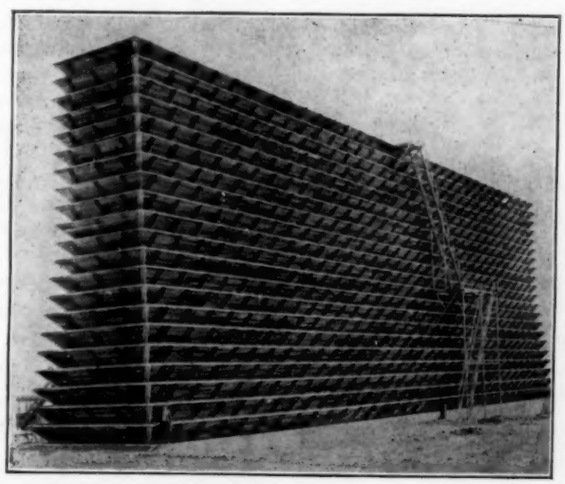
Water that is cooled for controlling the temperature of stock during the mixing process in the mills makes the circuit continually with but very little wastage. The amount required each day from the city supply for renewal to keep the system up to the required number of gallons is small.

During the cold winter month the primary ammonia cooling circuit is cut off and the cooling tower is made to supply refrigeration for the water circuits to the milling machines. During periods of several weeks at a time the tower with the aid of nature's wintry winds keeps the water for the mills at the required temperature and the ammonia compressors and coils are idle.

The refrigeration coils are in a vault-like cork-insulated room and are built in three units, each controlled by a compressor in the pump room. Here the ammonia, precooled by the water from the cooling tower, is expanded and the real refrigeration process takes place. Dripping over these coils the water is cooled for the mills and calenders and the large Banbury mixers, which require a minimum of 600 horsepower and a maximum of 1200 horsepower. Each of these refrigeration units is constructed and connected so that either of them may be used at a time, depending on the amount of cold water needed and the temperature of the atmosphere.

One man on each shift, of eight hours each, is all the force necessary to man the refrigeration plant. With a modern system of thermometers and other instruments that furnish accurate check on the performance of the various departments of the plant it is not a hard matter for one man to keep the system in smooth working order. With a battery of seven centrifugal pumps, adequately pumping machinery is assured in almost any emergency that may arise. Usually three of the pumps are in operation at one time.

Naturally the Miller engineers did not decide on the installation of their refrigerating plant without careful consideration as just the sort of plant they needed. Some rubber plants have found conditions which permitted them to use cooling water from rivers, lakes or wells without cooling to any great extent. The use of the cooling tower is especially interesting. Water cooling towers are being used more and more in rubber manufacturing plants as well as elsewhere, but before deciding on a cooling tower the eternal questions bob up: "Will it pay?" and "Won't it be more economical to install a water treating system and use water out of the well, lake or river?"



**A Large Cooling Tower Erected By the Same Company That Installed the New Miller Rubber Company Tower**

Several years ago I wrote an article on the advantages of cooling towers. Shortly following its publication I received a letter of criticism from a nationally known engi-

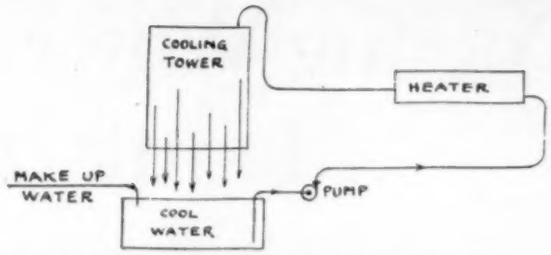
neer. I submitted his letter to a second engineer whom I know to be better versed in the engineering of cooling water than I am and he very kindly wrote his comments.

To be perfectly fair I am submitting both letters, with all names carefully removed, so that the reader can observe the arguments on both sides. This is what the first engineer, then employed by a cooling tower concern, wrote:

> "We of course realize that 'experts' are always infallible except in cases where they are mistaken. If we were to take the judgment of the 'expert' to whom you refer, we would, of course, go out of business at once. We are inclined to believe, however, that cooling towers are valuable as we have actual facts from customers who have installed our cooling tower, in which they state that they saved the entire cost of the installation within the first year's use. They did not have any trouble with anything accumulating in the 'heater,' but were much pleased to note the accumulation in their bank account.
>
> "We also note the letter from the Blank Company in regard to their criticism of your article and wish to suggest that the Blank Company seem to feel that concentrating the sediment in the cooling tower will bring more sediment on the condensers than if this same amount of sediment were in the original cooling water. As a matter of fact, the total sediment passing over the condensers with a cooling tower is only 1% as much as the total sediment which would pass over the same condensers with the same water without the use of a cooling tower. The only question that might come up would be whether the sediment which would be somewhat concentrated would adhere more easily to the condensers or not. If, however, it did adhere to the condensers, it would naturally be taken out of the water in the cooling tower and in the final analysis, it would merely be a question of the amount of sediment passing over the condensers.
>
> "We criticised your article only in one respect, that is, where you state—'The only real point against a cooling tower is its first cost, otherwise it is decidedly an economy factor.'
>
> "Unless the saving in the use of a cooling tower will give a return on the investment to justify such investment, no sensible engineer would recommend the installation of a cooling tower. Where the cost of the condensing water is an item of any kind, there is possibly a saving, but if the saving is not large enough to justify the investment of a cooling tower, then the cooling tower should not be put in.
>
> "There is another very important point, however, in this connection which you probably do not realize as much as we do and that is, that there are various constructions on the market and various constructions of 'home-made' designs that are called cooling towers and which do cool the water to a certain extent, but the cost of these is less than that of our cooling tower, which is designed and built on scientific principles to give high efficiency and at the same time a long life of the apparatus without maintenance cost of any consequence. The wise manager will compare the various cooling towers on the basis of efficiency, durability and first cost and he will no doubt find that our cooling tower, although at a considerably higher first cost, would in the end prove the cheapest. We mention this as it is a very important point in connection with the question of first cost."

Upon submitting the above to the second engineer, already mentioned, I received this reply:

> "We are enclosing herewith a diagram Fig. 1 and brief explanation of the factors involved in cooling tower operation and trust that this will serve to clear up the point under discussion.
>
> "The important factor that we believe you have overlooked is that the precipitation of scale from water is in proportion to the amount of hardness in that water, and due to the evaporation when cooling towers or spraying ponds are used, there is a gradual increase in the hardness of the water because the make-up water that replaces the evaporation is constantly carrying in a certain amount of hardness, while no hardness is being lost from the system.
>
> "We point out to you that cooling water is generally quite impure and contains sediment, etc., in addition to hardness so that some means of removing these undesirable impurities should always be provided for. If the cooling water is discharged to waste it simply passes straight through the system and requires a very large water softening and filtering unit to handle the large amount of water used. On the other hand when a cooling tower is placed in the system the water conditioning apparatus need only be large enough to treat the amount of water that is lost by evaporation and the initial investment and upkeep of the plant is therefore proportionately smaller."




**Sketch of a "Closed System" with Cooling Tower**

Referring to the sketch herewith, showing a "closed system with cooling tower," there are five points to bear always in mind, as follows:

1—Average cooling tower water evaporation loss is about 5%;
2—Only water evaporates. Hardness remains behind;
3—Make up water (about 5%) keeps adding hardness so that the total hardness in the system increases;
4—Rate of precipitation of hardness is in proportion to total amount of hardness i.e., water containing 40 grains per gal. will precipitate more scale than one containing only 20 grains per gal.;
5—Therefore there will be more scale formed in a condenser using a cooling tower than in one using the same water supply without a tower. As in the latter case the hardness remains the same while in the former it increases for the above reasons.

## Flexing of Tire Treads

IN a recent press notice mention was made of an apparatus built at the Bureau of Standards in Washington for observing, through a heavy plate glass, the flexing of tire treads. The Bureau has now prepared a technical paper describing the results of tests with this apparatus, as well as the results obtained by another method which proved to be a satisfactory one for obtaining similar data.

With the latter method a piece of sheet metal is given a thin coating of soft wax and is then sprinkled sparingly with grains of carborundum. A tire under the desired load and air pressure is rolled over the waxed plate, the carborundum grains stick to the tire and each traces on the plate the movement of the particular point on the tire to which it happens to stick. Some very interesting information concerning tread movements was obtained in this way, and the method has the advantage that it can be carried out with very little equipment.

## Los Angeles Second in Rubber Industry

WITH the completion of the Firestone western factory, Los Angeles becomes the second largest rubber manufacturing center in the world, first place being held by Akron. According to the Los Angeles Chamber of Commerce, the Goodyear, Goodrich, Samson and Firestone factories will give employment to more than 6,000 persons and the annual payroll will amount to approximately $9,000,000.

# Tests and Inspection in Rubber Footwear Factories

## As in Other Departments of the Rubber Industry, Each Step in the Manufacture of Rubber Footwear is Carefully Checked and the Finished Goods Are Even More Closely Examined

TESTS of raw material and inspection control at each process are necessary functions of management in a modern rubber footwear plant just the same as they are in a rubber tire factory or mechanical goods plant. They differ only by method in some cases and by stress upon factors which have a more vital relation to the shoe processes. Three main objects justify this service; first, to insure uniform and adequate wearing qualities in the finished product; second, to attain the best possible appearance in the merchandise; and third, to keep at a minimum the number of factory damaged shoes or "seconds" which increase costs by reason of the discount at which they must be sold.

Tests naturally commence in the laboratory where facilities for making them are concentrated. Footwear differs from many other rubber products in method of vulcanization. It is not a molded product and for this reason, the crude rubber used must be examined carefully for such impurities as bark or sand as these would readily cause blistered soles and uppers. Care must also be taken in uncasing rubber to see that splinters are not present. Compounding ingredients are put through the usual tests to see that they conform with specifications and are of the required fineness.

### Inspection of Footwear Fabrics

Dyed fabrics are checked with color standards and analyzed for bleeding. Knit fabrics particularly are run over the inspection table to see that the number of mends does not exceed the usual tolerances, and that the gumming and splitting is done properly so that there will not be undue waste in calendering and cutting. Tensile strength is checked on the Scott machine, thread count, weight, and yarn size determined. Woven fabrics such as sheetings, ducks, and drills are inspected for the usual fabric defects such as slubs, knots, drawn-in selvage, etc. Fibre and corrugated cases are checked on a Mullen tester for strength. Vulcanization tests are performed on enamelled parts such as buckles, eyelets, and snap buttons. Physical tests on special machines are made on such articles as automatic fasteners. Threads are tested for tensile on special thread testing machines. Thus the materials are vouched for before the process starts.

During the period immediately following the war, many rubber footwear mills set up a separate inspection organization which functioned apart from the production forces. This was necessary owing to conditions at that time when labor conditions were not of the best, and all mills were being pushed to the limit of their output. After the readjustment period which followed, this method was largely abandoned as it was found to be too cumbersome. Skilled labor became more plentiful, and overhead was of necessity reduced to the minimum. Then it was found that by having the same executives responsible for both production and quality, the best results could be obtained.

Inspection commences in the compound and mixing room where the batches are double checked for weight and samples taken for a laboratory cure which includes a gravity test. Mixing times are measured in accordance with pre-determined practice. Calendering inspection has been much simplified by the introduction of several machines for control of gauges such as the Atlantic Precision machine.

During the preliminary processes of preparing parts for making, it has been found that inspection can best be done by the operators themselves. In other words, the responsibility is put on the operator if he cuts cold-run stock, bloomed stock, or other unsatisfactory material. These defects would, of course, be recognized and the work rejected in the making room, but this is very costly not only on account of the labor expended on it but on account of the delay in replacing the parts.

Cements and varnish largely come under laboratory control and must be closely supervised as they are integral parts of shoemaking. It is in the making departments that the largest task of inspection falls. Each section of shoemakers has its inspector who examines each shoe to see that the parts are placed properly, that the foxing lines are even and conform to the desired height, that the soles are properly stitched, and that the required number of cement coats is applied. Rubber shoemaking is a skilled art, and the difference between a beautiful piece of merchandise and an ungainly, sloppy shoe largely rests in the hands of the operator who puts it together.

Control of vulcanization is largely safeguarded by temperature control charts, but the modern pressure vulcanizer has done much to improve rubber footwear quality by welding the parts more firmly together. After vulcanization the shoes are conveyed to the packing department, stripped from the lasts, trimmed where this is necessary as in the case of light rubbers, and placed on the packing tables for the final inspection and packing.

### Final Inspection Before Packing

This final inspection is in reality the most important as it is the last chance the manufacturer has to see his product before it goes to the customer. In order that no point may be overlooked which affects the quality, a prescribed routine of inspection is laid down which speeds up the work without impairing its efficiency. The first task is to mate the shoes, that is, to see that they consist of a right and left of the same size. This may seem superficial, but it is a fact that even with the rigid inspection, customers occasionally receive two rights or two lefts instead of a pair. The succeeding steps are as follows:

1. Take a shoe in each hand by the sides. Note if the lines of tops of uppers are even, and if the pair is right and left. Press the counters inward and disclose the condition where they join at the heel.
2. Place soles and heels flat together. Note both shoes are the same size, and that outsole is properly placed, rolled and stitched, and that strip is unwrinkled and even.
3. Bring inner sides of both shoes together and up-

right, with soles touching. Look for blemishes on upper and inside of shoe, that gauge at forepart is the same for both; that outsole is properly placed, rolled, and stitched, and toe strip is not wrinkled.

4. Take both shoes in right hand, tip toes up for examination. Turn left side of left shoe up, and note that sole is placed properly, rolled, and stitched, strip even, and no blemishes on side.

5. Turn shoes over and examine soles for size, brand, blisters, and smoothness of the bottom.

6. Turn toes down and heels up, note back seam is even and not cut through.

7. Inspect uppers for blemishes.

8. Inspect inside of shoes for varnish stains, dirty linings, cement line showing.

9. Return shoes to the table, heels to the edge of the table if perfect, toes if imperfect.

The shoes classified as "seconds" are given special examination by the chief inspector, who uses his judgment in confirming rejections. There are some minor defects in the nature of blemishes that detract from appearance which can be eliminated by a skilled repair man. Those finally rejected are classified by defects and held for review by the heads of the various departments responsible so that they can take steps to correct the trouble immediately.

The introduction of color and style elements in rubber footwear has made the matter of inspection assume even more importance. Even shoes whose defects only detract from appearance rather than wear can no longer be passed as "perfects," as style and fit are now integral parts of the perfect shoe.

But rubber manufacturers in the footwear field do not stop with the testing of their materials and inspection of the processes. The finished shoes are being tested constantly under various conditions. Some of the large factories have paid staffs of girls who walk a specied number of miles each day wearing test shoes. This was particularly true when the Goodrich "Zipper" first came on the market. Tennis soles are tested for wear by outfitting boys who give them unusually hard usage, work rubbers are tried out on railroad men, truckmen, and postmen who return them when worn out giving the days of service.

These tests are also supplemented by special machines in the factory, such as a rotating sole testing machine which rotates strips of sole stock against sandpaper to enable comparisons to be made. Stocks are aged in the oxygen bomb, shoes exposed to sunlight, heat, and other conditions.

We all know that the automobile user is getting more today for his "tire dollar" than ever before in history. Inspection and test in rubber footwear are proving to be good insurance for rubber footwear users in the same direction.

## Aqueous Emulsions of Asphalt

AQUEOUS emulsions of asphalt to protect metal surfaces exposed to severe weather or service conditions are being used successfully in the United States and have been suggested as ideal protection for metal structures in the tropics, as on rubber plantations or for rubber warehouses in the primary rubber ports. After the emulsion, which is made by a specially patented process, is applied to an exposed surface, the water quickly evaporates and the asphalt particles come into direct contact to form a continuous envelope. The asphalt surface is then dusted with Portland cement which sets along with the asphalt as the evaporation is completed. The cement adds to the appearance of the structure and the interior will be cooler than if the outside were left black. Furthermore, the cement will protect the asphalt from the ultra-violet rays of the sun and guarantee its long life.

## Rubber Estimates for 1929

IF rubber should continue to sell at a price averaging around 9 pence (18-19 cents), production in 1929 might well fail to equal consumption, regardless of the abolition of restriction, in the opinion of Faulkner & Winsor, rubber importers and dealers in London. In a recent statement this firm points out that such a price will stimulate consumption and curtail production. The company estimates that consumption during 1928 will reach 652,000 tons as against a production of 597,500 tons. For 1929 consumption is estimated at 707,000 tons and production at 685,500 tons. The chief increase in production would be in Malaya while the principal increase in consumption would be outside the United States, particularly in Russia. It is estimated by Faulkner & Winsor that the United States will require 405,000 tons of rubber this year and 425,000 tons in 1929.

## Automobile Production High

UNITED STATES production of automobiles for the first six months of the current year was 2,201,880 units, according to preliminary figures issued by the National Automobile Chamber of Commerce. This six-months production was the largest in history with the single exception of 1926 when the output during the first half of the year ran almost 160,000 vehicles more than this year. A production of well over 4,000,000 units in 1928 is freely predicted. New models now appearing are said to be finding such an enthusiastic reception that factories will be behind on orders for several weeks.

## Color Changes in Rubber

AT a recently held meeting of the Society of Chemical Industry of Victoria in Melbourne, H. M. Munro, of the Dunlop Rubber Company, related an interesting account of change of shade in a rubber compound after vulcanization. Yellow ochre was the offending pigment, and the rubber, instead of being yellow or buff color, was gray. Investigations in the laboratory showed that the iron oxide, of which the ochre consisted, is capable of forming a surface film of unstable sulphide on exposure to hydrogen sulphide gas, and is apparently some specific property of the ochre.

## 10 YEARS AGO

**Items Reprinted from July 25, 1918, issue of THE RUBBER AGE**

CRUDE rubber imports jumped to 24,124 tons during June . . . Firestone perfects new demountable rim for motor trucks . . . East Peoria, Ill., aids in financing Trublepruf tire concern . . . Mount Vernon-Woodberry Mills award contract for cotton duck factory . . . Goodyear brings out a patch for cord tires . . . Army tire repair schools in Akron have 107 enlisted men in attendance . . . F. W. Williams becomes manager of Firestone cycle tire and accesory department . . . Average weekly earnings of workers in the rubber trade in New York State, including office employees, during March was $16.34 . . . War Industries Board continue investigations on problem of crude rubber allocations . . . Every employee in the Mohawk Rubber Company, Akron, subscribes to the War Chest Fund, the average contribution being $25.80 . . . J. M. Dine, manager of the Omaha branch of the Goodyear Tire & Rubber Company, goes to Chicago as assistant manager . . . The following concerns announce that they are building new plants or enlarging their present facilities; Bottenfield Tire Company, Lancaster, Pa.; Triple Airless Tire Company, Pittsburgh, Pa.; Universal Tire & Rubber Company, Houston, Texas.

# The Benefits of Standardization

By O. J. Roberts

*The Diamond Rubber Co., Akron, Ohio*

**The Effective Elimination of Waste in the Rubber Industry Through Standardization of Products, Processes and Materials Is Described in this Interesting Address Before the National Industrial Advertisers' Association of Chicago on June 12.**

OUR National Chamber of Commerce is authority for an estimate that one-fourth of all industrial effort in America is wasted because of irrelevant diversification. This means the labor power of some 5,000,000 men and women and a full 25% in the cost of living. A scientist long on the staff of the U. S. Bureau of Standards estimates that for $2,000,000 spent annually in research along these lines a saving of at least $1,000,000,000 a year would follow the release of such information to the public at large. We may discount inwardly such a statement and be inclined to accept it with reservations, yet even a modest acceptance emphasizes the importance of this field.

Up to 15 or 20 years ago rubber compounding was shrouded in mystery and each compounder was a highly individualized artist and kept his own counsel largely as to how he secured his results. In fact, his particular qualifications determined the final profits a rubber manufacturer might hope to secure. Naturally, any man who could take a wide assortment of crude grades and utilize the many combinations involving reinforcing fillers, bulking agents, pigments, vulcanizers, etc., was a master cog. While today the art of compounding is still of strategic importance, specifications have been written along scientific lines with thorough knowledge as to the results to be expected. The result is that whereas under the hit and miss method previously in vogue, we used 3,400 compounds, today we secure better results with some 1,700 and of this number 15% give us 80% of our production.

In actual plant operation, we have found innumerable ways to cut down wastes of labor, space, and materials. As to labor, we have made continuous studies of how it could be better utilized, when it could best be replaced or supplemented by machinery. As an evidence of this I might say that in May, 1922, we were building 2.7 tires per man hour on core type tire machines, whereas in this last month of May we were building 4.63 tires per man hour on a drum model machine. In the mechanical rubber division where computation is much more difficult we can state definitely that we are getting twice the results per man hour as against 1922. In addition we are studying our entire labor situation in the light of the Bedaux System which reduced to simplest terms graphically measures or appraises labor in definite terms.

In the arrangement of space we get an absolute continuity of operation, each step is forward and toward the objective. Incoming materials are quickly scheduled and correlated as far as possible through their respective channels until they meet in final form for shipment out of the plant. The cost of warehouse stocks may be more fully appreciated when I point out that recently a large steel company had charts placed in its hands which showed that 3% a month was the carrying charge on warehoused goods due to obsolescence, insurance, rent, deterioration, upkeep, and other fixed charges.

Today we are saving materials we once threw away by making the saving at the source by standardizing on what we buy and then making the manufacturing operation fit in without loss. Or if there is a waste of material we have definitely charted outlets. We have found ways and means to reconvert or reclaim unused materials.

Our better position from the standpoint of improved processes is shown in the fact that in 1918 we milled 800,000 pounds of rubber per day with a force of 18,000, while today we are milling 1,000,000 pounds with a force of 12,000.

My introduction to selling mechanical rubber goods in a so-called scientific way, was to have the opportunity to observe an old time salesman pick up a competitor's piece of goods, smell of it, bite it, and then snap it—all done with obvious skepticism. Today a salesman knows that what he has to sell is an intelligently built piece of goods, concerning which he has full information.

I can recall very vividly how a tire salesman couldn't tell how good his tubes were, but he stumped a competitor in a customer's office by hanging out an office window on a tube manufactured by his own company. This is selling by faith. Fortunately, we today do not rely on such methods, not because the dangers of such selling would be greater but because our knowledge of our products is so much better.

In a very natural way, the history of mechanical rubber goods sales shows that individual tastes of buyers and salesmen were very much catered to. This man wanted a red belt, this man a green hose, this man wanted a bulky belt, and this man a heavy packing. All who had confidence in their own ideas wanted goods under special brands. The factory had to carry emergency stocks of all kinds and descriptions and no two demands were ever very much alike. Then if odd lengths in odd sizes were required, special

## Results of Standardization Quoted by Mr. Roberts

1. **The number of compounds in use has been reduced from 3,400 to 1,700 and 15 per cent of the latter cover 80 per cent of the production.**
2. **In May, 1922, the production per man-hour on core type tire machines was 2.7 tires; in May, 1928, it was 4.63 tires.**
3. **In 1918 the milling of 800,000 pounds of rubber per day required a force of 18,000; in 1928 the milling of 1,000,000 pounds requires a force of only 12,000.**

runs had to be made, always in breakdown haste. There was waste at every hand. With all the abuses incident to such a scheme of distribution, the price angle was hopelessly confused. Prices disregarded basic factors. Today, distributors and their customers are protected by simplified production programs and well understood methods of figuring costs.

To show to what extreme diversification may go, we can point out there have been some six hundred sizes and varieties of fire hose couplings in the United States. We know the terrible cost to Baltimore when, in its great fire, apparatus from New York, Philadelphia, and Washington had to stand practically idle because of the dissimilarity of their standards. Also we understand that one railroad in this country has to stock 29 different non-standard couplings with special fittings and adapters to link up its various cities. Fortunately, these conditions are rapidly being changed.

To show accurately what can be done, it may be pointed out that the number of sizes on one line of conveyor belt regularly used has been reduced from 56 to 16; another line from 80 to 14; elevator and transmission belting from 14 to 7; the number of hose constructions in six different types from 10 to 5, and reduced number of sizes 50%, with savings averaging 20%. At the same time the variety of stocks has been increased because of being able to move the standardized sizes.

### Standardization Helps Everyone

It is generally appreciated in other lines that those manufacturers who have adopted standardization and simplification programs have been benefited through lower investment and equipment costs, through improved production, faster turnover, ability to handle more complete and compact lines, and reduced selling and handling expenses. The consumer has gained through better quality, improved service, and lower maintenance costs. The worker has benefited through the stabilizing of operations, increased output, and increased earning power.

In eleven different lines which have adopted simplification, a survey has been made to determine the degree of adherence to the simplified practice recommendations—and this has been found to be 79%. In other words, an average of practically four-fifths of the year's output in these lines conforms to the standardized sizes, dimensions, etc. This degree of support for simplified practice demonstrates that the companies cooperating have found that it is both practical and profitable.

The real opportunity for savings, however, lies in the less tangible unmathematical field of distribution. It is of course difficult to think of sales effort in terms of standardization for we know that imagination, personality and circumstantial conditions of many kinds interplay in any sales work to such an extent that it is impossible to say what is the most logical or economical method of solicitation. However, I believe that there is an exceptional opportunity from the standpoint of simplification of selling in point of a better understanding of objectives and more commonsense procedure to bring them to materialization.

We all realize the tremendous significance of the standardization and simplification movement. It is really just starting. It is asserting itself not alone in business, but is making tremendous strides in religious and social service fields—and most importantly is going to be felt in all types of political and governmental units. Many feel that the tremendous savings in the use of human material will prove costly to society in other directions. This can only be true in an immediate and temporary sense for in the long run all the savings made can only bring about the most wholesome results; better human existence, more comforts, more leisure to all, truth, honesty, and widespread intelligence.

## Tire and Tube Output Beats All Records

THE production of tires and inner tubes by the rubber manufacturing industry in the United States during May not only was considerably higher than the output in April but exceeded all records for any one month in the history of the industry, according to the report of the Rubber Association of America, Inc. Shipments from factories also showed an encouraging increase and indicated a high volume of unit sales on the part of dealers.

The figures for May as released by the Rubber Association represent 75 per cent of the total industry in the United States and have been brought up to represent 100 per cent in the following table:

TIRE AND TUBE PRODUCTION

| | April, 1928 | | | May, 1928 | | |
|---|---|---|---|---|---|---|
| | *Prod.* | *Ship.* | *Inven.* | *Prod.* | *Ship.* | *Inven.* |
| Pneumatic Casings | *(All Figures Represent Thousands)* | | | | | |
| All types | 6,178 | 5,812 | 12,717 | 6,759 | 6,457 | 13,024 |
| Balloon | 4,412 | 3,978 | 6,544 | 4,878 | 4,314 | 7,225 |
| High Pressure Cord | 1,744 | 1,797 | 5,775 | 1,872 | 2,094 | 5,536 |
| High Pressure Fabric | 25 | 37 | 398 | 9 | 49 | 263 |
| Solid and Cushion Tires | 58 | 56 | 206 | 62 | 63 | 204 |
| Inner Tubes | | | | | | |
| All types | 6,661 | 5,702 | 16,638 | 7,168 | 6,300 | 17,702 |
| Balloon | 4,489 | 3,754 | 8,579 | 4,927 | 4,015 | 9,408 |
| High Pressure | 2,171 | 1,946 | 8,060 | 2,241 | 2,285 | 8,295 |

Further detailed comparative tables covering previous months with yearly totals, will be found in the statistical section of issue of The Rubber Age.

## Rim Production Sets New Record

THE production of automobile rims during June not only exceeded the output in the corresponding month last year but established a record in the history of the industry. The number of rims inspected and approved by the Tire and Rim Association of America, Inc., during June totaled 2,429,453 rims as compared with 2,185,592 rims in May. The high output reflects the activity in automobile production which has prevailed for the last few months.

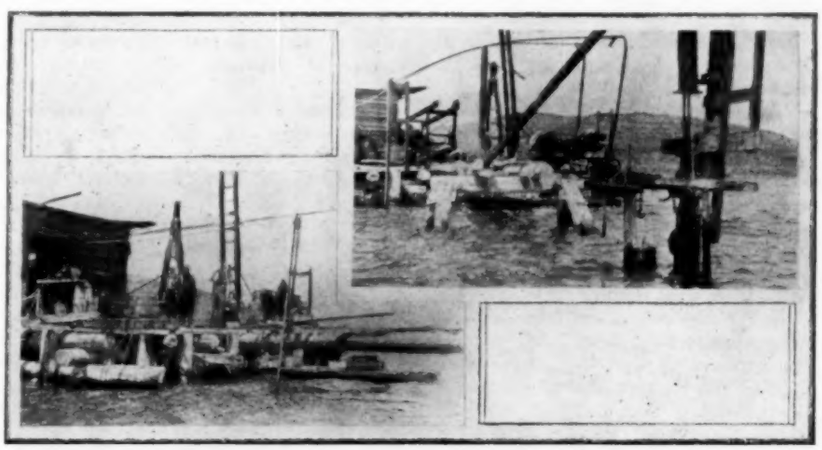
| Rim Size | June 1928 No. | % | 6 Mos. 1928 No. | % |
|---|---|---|---|---|
| Motorcycle | | | | |
| 24x3 | 3371 | 0.1 | 21171 | 0.2 |
| 26x3 | 7190 | 0.3 | 27388 | 0.2 |
| 28x3 | —— | — | 753 | 0.0 |
| *Total* | 10561 | 0.4 | 49312 | 0.4 |
| Clinchers | | | | |
| 30x3½ | 73155 | 3.0 | 248531 | 2.0 |
| 31x4 | —— | — | 1968 | 0.0 |
| *Total* | 73155 | 3.0 | 250499 | 2.0 |
| 18" Balloon | | | | |
| 18x3½ | —— | — | 9362 | 01. |
| 18x4 | 79620 | 3.3 | 689040 | 5.3 |
| 18x3.25 | 24453 | 1.0 | 39738 | 0.3 |
| 18x4½ | 24666 | 1.0 | 78299 | 0.6 |
| 18x5 | —— | — | 78 | 0.0 |
| *Total* | 128739 | 5.3 | 816517 | 6.3 |
| 19" Balloon | | | | |
| 19x2.75 | 6353 | 0.3 | 6353 | 0.1 |
| 19x3½ | 208479 | 8.6 | 1169779 | 9.0 |
| 19x4 | 193368 | 8.0 | 1190374 | 9.2 |
| 19x3.25 | —— | — | 4741 | 0.0 |
| 19x4½ | 116168 | 4.8 | 569953 | 4.4 |
| 19x5 | 5813 | 0.2 | 7503 | 0.1 |
| *Total* | 530181 | 21.9 | 2948703 | 22.8 |
| 20" Balloon | | | | |
| 20x2.75 | 28112 | 1.2 | 32160 | 0.3 |
| 20x3½ | 20640 | 0.9 | 334230 | 2.6 |
| 20x4 | 359038 | 14.7 | 1931832 | 14.9 |
| 20x4½ | 35246 | 1.4 | 197899 | 1.5 |
| 20x5 | 115314 | 4.8 | 353532 | 2.8 |
| 20x6 | 10033 | 0.4 | 64456 | 0.5 |
| *Total* | 568383 | 23.4 | 2914109 | 22.6 |
| 21" Balloon | | | | |
| 21x2.75 | 594418 | 24.5 | 3357462 | 25.7 |
| 21x3½ | 148419 | 6.1 | 441096 | 3.4 |
| 21x4 | 28952 | 1.2 | 404997 | 3.1 |
| 21x4½ | 14183 | 0.6 | 234975 | 1.8 |
| 21x5 | 1084 | 0.0 | 7240 | 0.1 |
| 21x6 | 1330 | 0.1 | 2715 | 0.0 |
| *Total* | 788386 | 32.5 | 4448485 | 34.1 |
| 22" Balloon | | | | |
| 22x3½ | —— | — | 1509 | 0.0 |
| 22x4 | —— | — | 1565 | 0.0 |
| 22x4½ | 810 | 0.0 | 1450 | 0.0 |
| *Total* | 810 | 0.0 | 4524 | 0.0 |
| High Pressure | | | | |
| 30x3½-23 | 3390 | 0.1 | 30337 | 0.2 |
| 31x4 -23 | —— | — | 640 | 0.0 |
| 32x4½-23 | 18164 | 0.7 | 46735 | 0.4 |
| 32x4 -24 | 10309 | 0.4 | 40120 | 0.3 |
| 33x4½-24 | —— | — | 406 | 0.0 |
| 32x3½-25 | —— | — | —— | — |
| 33x4 -25 | 548 | 0.0 | 1841 | 0.0 |
| 34x4½-25 | 204 | 0.0 | 4331 | 0.0 |
| *Total* | 32615 | 1.2 | 124410 | 0.9 |
| 20" Truck | | | | |
| 30x5 | 184315 | 7.6 | 991054 | 7.6 |
| 32x6 | 59657 | 2.5 | 221250 | 1.7 |
| 34x7 | 15041 | 0.6 | 62364 | 0.5 |
| 36x8 | 4851 | 0.2 | 32890 | 0.3 |
| 40x10 | 844 | 0.0 | 2986 | 0.0 |
| *Total* | 264708 | 10.9 | 1310544 | 10.1 |
| 22" Trucks | | | | |
| 36x7 | 4989 | 0.2 | 7787 | 0.1 |
| 38x8 | —— | — | 200 | 0.0 |
| *Total* | 4989 | 0.2 | 7987 | 0.1 |
| 24" Truck | | | | |
| 34x5 | 3674 | 0.1 | 12712 | 0.1 |
| 36x6 | 3757 | 0.2 | 23739 | 0.2 |
| 38x7 | 11400 | 0.5 | 33959 | 0.3 |
| 40x8 | 5532 | 0.2 | 17905 | 0.1 |
| 44x10 | 316 | 0.0 | 796 | 0.0 |
| *Total* | 24679 | 1.2 | 89111 | 0.7 |
| Airplane | | | | |
| 12x3 SS | 8 | 0.0 | 19 | 0.0 |
| 18x3 SS | —— | — | 56 | 0.0 |
| 20x3½ SS | 800 | 0.0 | 1371 | 0.0 |
| 20x4 SS | 518 | 0.0 | 538 | 0.0 |
| 21x4 SS | 21 | 0.0 | 21 | 0.0 |
| 20x5 SS | 44 | 0.0 | 52 | 0.0 |
| 20-6 SS | 199 | 0.0 | 2265 | 0.0 |
| 18x4 C. | 657 | 0.0 | 5516 | 0.0 |
| *Total* | 2247 | 0.0 | 9838 | 0.0 |
| TOTAL | 2,429,453 | | 12,974,039 | |

Scene of the Bitumen Deposits on the Shore of Great Salt Lake

# Mineral Rubber from Utah Again?

## *Bitumen from Great Salt Lake May Again Be Used as Mineral Rubber*

REPORTS recently circulated in the United States and abroad have indicated that a considerable yield of "rubber" was possible from the deposits of bitumen which have been re-discovered on the shore of Great Salt Lake in Utah. These reports have invariably touched upon the need for an expanding crude rubber supply and have indicated to the uninformed that the Great Salt Lake bitumen might be of great importance in this regard.



(Left) Drilling Test Pipes Into the Bitumen Bed. (Right) View Showing Part of the Workings and One of the Wells

The rubber industry knows of course that there is no rubber in this bitumen, although the present activity does reopen the question of its use as a mineral rubber. The rubber industry is fully acquainted with the deposits in question since a number of years ago large quantities of bitumen from the same localities were sold as mineral rubber at about $100 a ton. After being operated for a few years the deposits were practically abandoned because mineral rubber were produced and sold in the East at prices considerably lower. Today less than one per cent of the mineral rubber used in the rubber industry comes from the Great Salt Lake district.

The product from the new deposit is described by the U. S. Geological Survey as a "black, viscous, molasses-like liquid, consisting of 99.9 per cent of saturated sulphur oil created by the decay of fossil remains and sealed clay beds." In order to mine this bitumen holes six feet in diameter are dug with the aid of steel caissons dropped through the water. These shafts are sunk to points below the various beds of bitumen. The caisson wall is then tapped on a level with the bed, and barrels are placed beneath the top holes. After the barrels have been filled by the flow from the beds, they are lifted out of the caissons.

According to the U. S. Geological Survey there are about five square miles, or 3,000 acres, underlaid by this bed of bitumen. This bed in Utah is said to be one of the world's largest deposits of this material. South America has two large beds but the cost of clarifying the South American product is claimed to be very high. On the other hand, the Utah product is said to require much less treatment. When these deposits in Utah were first discovered, about 1861, they were for the most part above the water-level. Since then, however, they have been inundated. As is seen in the illustration at the top of the page, some of the deposits can still be worked from the shore. But the great part of the area is now under water and work is being undertaken by the means shown in the two smaller photographs.

Whether the rubber industry will again make any extensive use of the Utah bitumen will depend upon the element of cost since satisfactory mineral rubber is being secured from other sources at low prices. Although work is just getting underway at Great Salt Lake, those in charge are reported as being confident that their cost of production will be low enough to permit their product to compete.

# RUBBER CHEMISTRY and Technology

## Plasticity and Elasticity of Rubber

*By* A. Van Rossem and H. Van Der Meyden

*Presented before the International Congress for the Testing of Materials, held at Amsterdam, Holland, September* 12-17, 1927, *and Printed in the Official Minutes Thereof*

PLASTICITY determinations of raw and masticated rubber have in recent years attracted a great deal of the rubber chemists' attention, as the publications of Marzetti[1], Williams[2], De Vries[3], Griffiths[4] and others have proved. In various laboratories, plasticity measurements have even become routine tests for raw and masticated rubber.

There are, generally speaking, two methods of determining the plasticity of rubber, viz.:

(1) The extrusion method, in which the masticated dough is extruded through an orifice (Marzetti), and the extruded portion weighed. This method can be used only for masticated rubber and rubber mixings.

(2) The compression method, in which a piece of raw or masticated rubber is compressed and the decrease in thickness is measured.

The latter method has been used in the past by many investigators for plasticity measurements of various substances, *e.g.*, by Speedy[5], who as long ago as 1920 carried out plasticity determinations on guttapercha, balata, and various bitumens with the Widney resiliometer, an apparatus based on the compression principle. Williams[2] was the first to apply this method, in 1924, to the determination of the plasticity of rubber, and since then De Vries[3] especially has made use of this method in his extensive investigations of the plasticity of raw rubber.

In the Netherland Government Rubber Institute also, plasticity measurements have been made according to this second method. The plastometer used for these experiments was constructed by J. A. C. van Kampen, instrument maker of the laboratory of Technical Botany, Technical University, Delft. For the details of its construction reference may be made to the publication of De Vries[3], who used the same instrument.

One important alteration was made in the instrument. Most of the previous investigators have compressed the rubber between two parallel plane surfaces and have measured the decrease in thickness in relation to time. During such measurements the surface of the rubber under pressure is continuously increasing, and therefore the pressure per unit of surface is continuously diminishing.

Bingham[6], who more than any other investigator has contributed towards the theory of plasticity, always used a constant pressure per unit surface in his experiments. It seemed advisable, therefore, to have a constant pressure per unit surface in our plasticity experiments. This condition is easily fulfilled by pressing the rubber on a platform of 1 sq. cm surface, screwed into a loose ground plate. In this way the rubber flows from the platform and only a constant area is pressed.

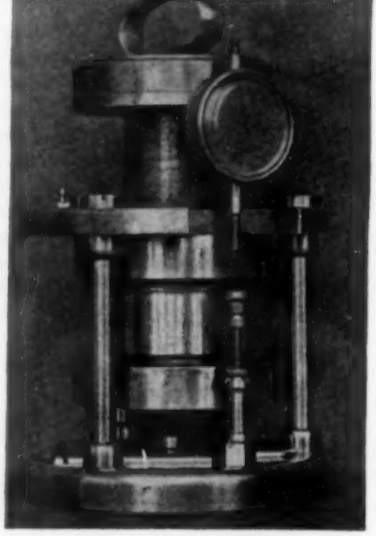


**Fig. 1—Plastometer with Loose Plate and Platform**

Fig. 1 gives a photograph of the plastometer, the loose plate with platform being clearly visible.

The decrease in thickness of the rubber is measured by a gauge, which reads to 0.01 mm., and the plastometer can be used at any temperature by making use of a constant temperature thermostat or drying oven with glass window.

Various investigators carrying out plasticity measurements have simply determined the curve of decrease of thickness in relation to time of pressure, and have used the thickness of the rubber after an arbitrary period of time as a measure of plasticity[7]. It may be pointed that such curves do not establish the plasticity of the material under investigation.

Maxwell[8] gave the following definition of plastic bodies: "If the form of a body is found to be *permanently* altered when the stress *exceeds a certain value*, the body is said to be soft or plastic." It is particularly the permanency of this alteration of form, which decides whether plasticity or some other physical property is measured.

If the alteration in form is not permanent, the substance is either viscous or elastic. It is therefore of great importance in plasticity measurements not only to measure the decrease in thickness, but also to observe any recovery when the applied weight is raised[9], and to measure the recovery in relation to time.

Bingham[10], in his excellent treatise on *Plasticity and Elasticity*, distinguishes three possibilities in regard to deformation under shearing stress:

(1) *Elasticity.*

Deformation occurs instantaneously and after removing the stress recovery is instantaneous.

(2) *Plastic flow.*

After removing the stress, there is no recovery.

(3) *Pseudo elastic flow.*

After removing the stress, a slow recovery (the so-called elastic after-effect) occurs.

These considerations have been applied to our plasticity determinations on rubber. The following is a brief outline of the results obtained with masticated and with vulcanized rubber.

### Masticated Rubber

First latex crepe was masticated for 15 minutes. With a plastometer of the type just described the compression curve, *i.e.*, the crease in thickness of the rubber under a constant load of 5 kgs. per sq. cm., was determined at increasing temperatures. The results of these determinations are shown in Table 1 and graphically represented in Fig. 2.

It is obvious from the results that masticated rubber becomes softer with increasing temperature.

From the considerations advanced above, it is evident that the curves in Fig. 2 do not establish the plasticity of masticated rubber.

These curves might be given equally well by a highly viscous material such as bitumen, or by a soft elastic material. Therefore the recovery of the compressed rubber was studied at the same temperatures. The results obtained at 16°C., 45°C., and 70°C. have been compiled in Table 2, while the results at 16°, 30°, 45°, 50°, 60° and 70°C. are all graphically represented in Fig. 3.

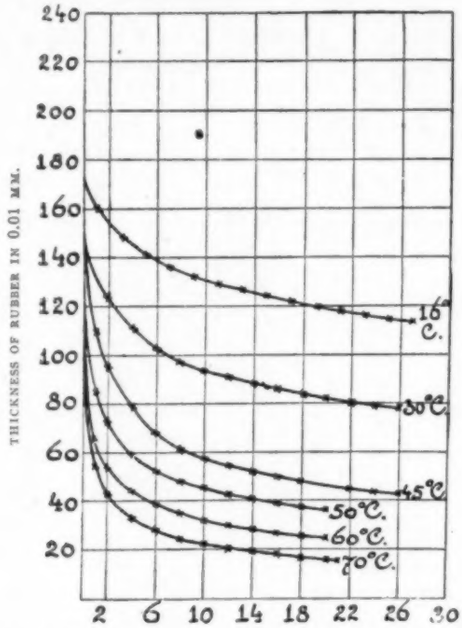



**Fig. 2—Time of Pressure in Min. Influence of Temperature on the Compression of Masticated Rubber**

TABLE 1. INFLUENCE OF TEMPERATURE ON THE COMPRESSION OF MASTICATED RUBBER. FIRST LATEX CREPE MASTICATED 15 MIN.

| Time | Thickness of rubber in 0.01 mm. at 16°C. | at 30°C. | at 45°C. | at 50°C. | at 60°C. | at 70°C. |
|---|---|---|---|---|---|---|
| After 1 min. | 160 | 132 | 110 | 85 | 66 | 55 |
| After 2 min. | 153 | 123 | 94 | 73 | 54 | 43 |
| After 3 min. | 147 | 116 | 85 | 65 | 48 | 37 |
| After 4 min. | 144 | 110.5 | 78 | 58.8 | 44 | 33 |
| After 5 min. | 141 | 106.5 | 73 | 55.1 | 41.5 | 30.5 |
| After 6 min. | 138.5 | 103 | 68 | 52 | 39.4 | 28 |
| After 7 min. | 136 | 100 | 65 | 50.2 | 37.2 | 26 |
| After 8 min. | 134 | 97.9 | 62 | 48.4 | 35.6 | 25 |
| After 9 min. | 132.5 | 96.3 | 59.5 | 47.0 | 34 | 23.8 |
| After 10 min. | 131 | 94.5 | 57.8 | 45.5 | 33 | 22.5 |
| After 11 min. | 129.5 | 92.8 | 56 | 44.2 | 32.0 | 21.8 |
| After 12 min. | 128 | 91.5 | | 43.0 | 31.0 | 20.8 |
| After 13 min. | 126.7 | | 54 | 42.0 | 30.0 | 20 |
| After 14 min. | 125.5 | 89 | 52.5 | 41.2 | 29.3 | 19.2 |
| After 15 min. | 124.5 | 87.8 | 51 | 40.5 | 28.7 | 18.8 |
| After 16 min. | 123.5 | 86.6 | 50.1 | 39.9 | 28.0 | 18.0 |
| After 17 min. | 122.6 | 85.5 | 49.2 | 39.0 | 27.3 | 17.5 |
| After 18 min. | 121.7 | 84.4 | 48.3 | 38.2 | 26.8 | 17.0 |
| After 19 min. | 120.8 | 83.6 | | 37.5 | 26.2 | 16.7 |
| After 20 min. | 119.9 | 82.9 | 47.0 | 36.8 | 25.8 | 16.3 |
| After 21 min. | 118.8 | 81.9 | | | | 15.9 |
| After 22 min. | 118 | 81.2 | 45.8 | | | |
| After 23 min. | 117 | 80.7 | 45.1 | | | |
| After 24 min. | 116 | 80.0 | 44.5 | | | |
| After 25 min. | 115.2 | 79.3 | 44 | | | |
| After 26 min. | 114.5 | 78.5 | 43.5 | | | |
| After 27 min. | 114.0 | | | | | |

At 16°C. we see a small elastic recovery, followed by a large elastic after-effect; in 130 minutes the original thickness is fully recovered. At 30° C. the recovery takes 200 min., but at 45°C. there is only partial recovery, and therefore at this temperature masticated rubber is partly plastic. At 60°C. plasticity is still more marked, and at 70°C. there is only a very small elastic after-effect and the material is practically fully plastic.

It is obvious, that the compression curves alone are misleading. since masticated rubber at 16°C. does not show real plasticity, but only pseudo-plastic flow, with an elastic after-effect, while the same rubber at 70°C. shows real plasticity, practically no elastic after-effect being visible after removing the pressure.

## Vulcanized Rubber

For various reasons, which may be omitted here, it seemed likely that vulcanized rubber at high temperatures possessed a certain amount of plasticity. To investigate this possibility, plasticity determinations have been carried out with vulcanized rubber of increasing degree of vulcanization.

A mixing of 92½ parts of first latex crepe and 7½ parts of sulfur was vulcanized during increasing times of cure ranging from 30 to 240 minutes at 147°C.

With the plastometer the relation of compression to time of pressure was determined at various temperatures, *e.g.*, 18°, 100°, 130°, and 147°C.

The results obtained at a temperature of 147°C. have been represented graphically in Fig. 4. As has been pointed out above, these curves do not establish plasticity, and therefore the recovery has been studied at 18°, 100°, 130°, and 147°C.

For the sake of brevity the tables containing the measurements of recovery with time will not be reproduced here. The measurements at 147°C. are represented graphically in Fig. 5.

As with unvulcanized rubber, three properties of the vulcanized rubber were distinguishable:

*a.* Elastic recovery, *i.e.*, an instantaneous recovery.
*b.* Elastic after-effect, *i.e.*, a slow recovery.
*c.* Plasticity, *i.e.*, the residual permanent compression.

These three properties have been expressed as percentages of the total compression after 30 min. pressure, and the values in per cent are shown in Table 3.

From these figures the following conclusions may be derived:

*At 18°C.* For short times of cure the vulcanized rubber shows elastic recovery, and elastic after-effect, with no plasticity. The elastic recovery increases rapidly with time of cure, being 100% for 150 and 240 min. cure.

*At 100°C.* Undervulcanized rubber (30 min. cure) shows elastic recovery, some elastic after-effect and also a certain degree of plasticity, which diminishes to zero at longer times of cure. After 240 min. vulcanization the rubber shows only elastic recovery.

TABLE 2. RECOVERY OF COMPRESSED RUBBER SLABS AT VARIOUS TEMPERATURES. THICKNESS IN 0.01 MM.

| Temperature 16°C. Original thickness 210 Compressed to 115 | | Temperature 45°C. Original thickness 218 Compressed to 44 | | Temperature 70°C. Original thickness 190 Compressed to 17 | |
|---|---|---|---|---|---|
| After 1 min. | 130 | After 1 min. | 46 | After 1 min. | 22 |
| After 5 min. | 155 | After 3 min. | 57 | After 7 min. | 27 |
| After 10 min. | 173 | After 8 min. | 64 | After 20 min. | 27 |
| After 15 min. | 178 | After 13 min. | 71 | After 30 min. | 28 |
| After 20 min. | 183 | After 18 min. | 80 | After 1 h.30 min. | 30 |
| After 25 min. | 189 | After 23 min. | 84 | After 2 h. 30 min. | 32 |
| After 30 min. | 192 | After 28 min. | 86 | After 3 hours | 32 |
| After 40 min. | 197 | After 1 h. 35 min. | 113 | After 4 h. 30 min. | 33 |
| After 45 min. | 198 | After 1 h. 48 min. | 117 | After 5 h. 30 min. | 33 |
| After 50 min. | 199 | After 2 hours | 119 | After 24 hours | 35 |
| After 1 hour | 201 | After 2 h. 30 min. | 123 | After 3 x 24 hours | 35 |
| After 1 h. 5 min. | 202 | After 3 h. 30 min. | 125 | | |
| After 1 h. 20 min. | 205 | After 4 hours | 126 | | |
| After 1 h. 30 min. | 207 | After 5 hours | 127 | | |
| After 1 h. 50 min. | 209 | | | | |
| After 2 hours | 210 | | | | |
| full recovery elasticity elastic after-effect | | part recovery elastic after-effect plasticity | | small recovery plasticity | |

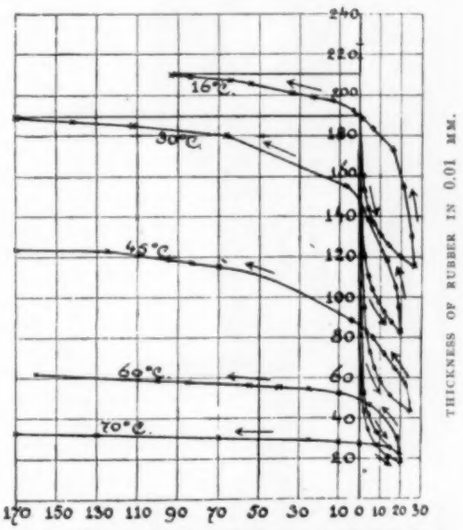



**Fig. 3—Elasticity and Plasticity of Masticated Rubber at Various Temperatures**

TABLE 3. ELASTICITY AND PLASTICITY OF VULCANIZED RUBBER AT VARIOUS TEMPERATURES.

(Mix: First Latex Crepe: 92½ parts; Sulfur: 7½ parts)

| Time of cure | Total compression 100 Per Cent | Elastic compression Per Cent | Elastic recovery Per Cent | Elastic after-effect Per Cent | Plasticity or permanent set Per Cent |
|---|---|---|---|---|---|
| | | at 18°C. | | | |
| 30 min. | 100 | 78 | 59 | 37 | 4 |
| 60 min. | 100 | 83 | 81 | 19 | 0 |
| 90 min. | 100 | 87 | 89 | 11 | 0 |
| 120 min. | 100 | 93 | 93 | 7 | 0 |
| 150 min. | 100 | 93 | 100 | 0 | 0 |
| 240 min. | 100 | 95 | 100 | 0 | 0 |
| | | at 100°C. | | | |
| 30 min. | 100 | 84 | 62 | 18 | 20 |
| 60 min. | 100 | 88 | 85 | 15 | 0 |
| 90 min. | 100 | 93 | 95 | 5 | 0 |
| 120 min. | 100 | 96 | 94 | 6 | 0 |
| 150 min. | 100 | 96 | 93 | 7 | 0 |
| 240 min. | 100 | 97 | 100 | 0 | 0 |
| | | at 130°C. | | | |
| 30 min. | 100 | 74 | 23 | 53 | 24 |
| 60 min. | 100 | 84 | 71 | 14 | 15 |
| 90 min. | — | — | — | — | — |
| 120 min. | 100 | 83 | 75 | 23 | 2 |
| 150 min. | — | — | — | — | — |
| 240 min. | 100 | 92 | 92 | 8 | 0 |
| | | at 147°C. | | | |
| 30 min. | 100 | 82 | 21 | 25 | 54 |
| 60 min. | 100 | 71 | 38 | 24 | 38 |
| 90 min. | 100 | 76 | 45 | 32 | 23 |
| 120 min. | 100 | 71 | 55 | 18 | 27 |
| 150 min. | 100 | 75 | 61 | 16 | 23 |
| 240 min. | 100 | 70 | 65 | 7 | 28 |

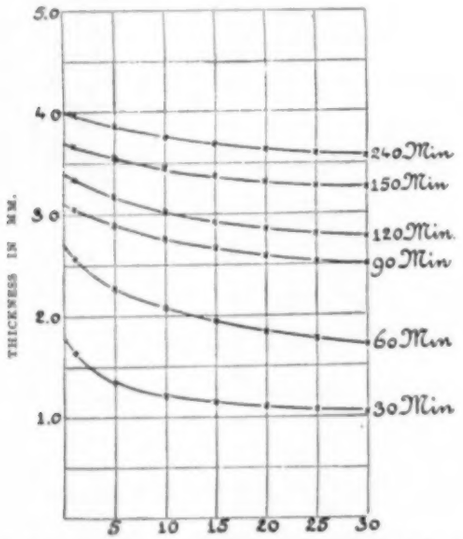



**Fig. 4—Relation between Compression and Time of Pressure at 147°C. for Vulcanized Rubber of Increasing Time of Cure**

*At* 130°*C.* The vulcanized rubber has the same properties as at 100°C., though the undervulcanized rubber (30 min. cure) shows a larger percentage of elastic after-effect.

*At* 147°*C.* The relation between the properties has considerably changed.

The undervulcanized rubber shows a much smaller degree of elastic recovery and of elastic after-effect, and a larger plasticity. With increasing time of cure the elastic recovery increases to 65%, the elastic after-effect decreases to 7%, and the plasticity decreases slowly, but even after vulcanization for 240 min. is still 28%.

These figures prove that vulcanized rubber shows considerable plasticity. In the case of undercured rubber, this is obvious even at 100°C., while rubbers cured for longer periods show considerable plasticity but only at 147°C. These considerations are important from a scientific as well as from a technical standpoint.

The foregoing results in regard to plasticity have been derived only from compression-recovery tests. It will be highly important to get a better insight into the elastic and plastic properties at high temperatures during elongation tests also. Only a thorough study of elasticity-plasticity relations under various conditions will give us eventually a real constructive view of the qualities of rubber.

It may be pointed out also that the experiments described above require to be coordinated with the results of X-ray tests of rubber under compression, as it is probable that the properties of rubber may be explained to a considerable extent from its X-ray spectrograms.

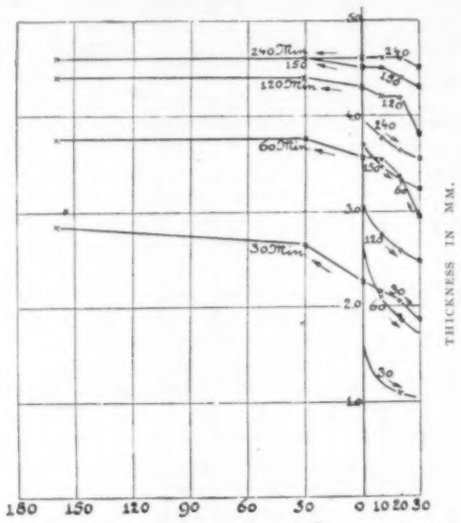



**Fig. 5—Time in Minutes. Elasticity and Plasticity of Vulcanized Rubber at 147°C.**

[1] *Giorn. Chim. Ind. Applicata* **5,** 342 (1923). See also *India Rubber J.* **66,** 417 (1923).
[2] *Ind. Eng. Chem.* **16,** 362 (1924).
[3] *Archief Rubbercultuur* **8,** 223 (1925).
[4] *Trans. Inst. Rubber Ind.* **1,** 308 (1925).
[5] *J. Soc. Chem. Ind.* **39,** 18T (1920).
[6] *Fluidity and Plasticity* (New York **1922**).
[7] Compare *e.g.*, Williams *loc. cit.*, Griffith *loc. cit. Report of the Physical Testing Committee of the Division of Rubber Chemistry, Ind. Eng. Chem.* **17,** 535 (1925).
[8] Compare: Bingham, *Fluidity and Plasticity*, p. 215.
[9] De Vries has also drawn attention to this point, cf. *Archief Rubbercultuur* **8,** 247 (1925).
[10] J. Franklin Inst. **197,** 99 (1924).

## Rubber Latex in Paper Making

IN a recent article reviewing the history of the use of rubber latex in the manufacture of special qualities of paper, appearing in *Paper Trade Journal* of May 31, 1928, Joseph Rossman, patent attorney of Washington, D. C., follows the development of latex paper making from the time when a man by the name of Bickford took out a patent in 1867 for making paper pulp by disintegrating the common milkweed (*Asclepias subulata*) to the recent patent granted Frederick Kaye and which has caused considerable interest in the rubber trade press.

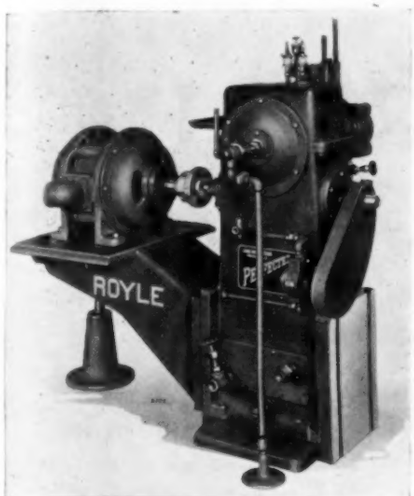
The Kaye process consists briefly in adding to the paper pulp rubber latex diluted to contain only a small content of rubber relative to the wight of paper to be produced, mixing the pulp and diluted latex, adding a coagulative agent to the mixture, and after suitable coagulation, passing the mixture through a paper-making machine.

Highly satisfactory paper has been manufactured using the latex of Hevea brasiliensis, and containing 0.5 per cent, 1 per cent, 2 per cent, 4 per cent and 5 per cent of rubber to the weight of dried paper, while much more resinous latexes have been successfully used to produce papers for special purposes containing as much as 10 per cent of coagulative material. The folding number, as determined by the Schopper folding machine, of samples of paper containing 0.5 per cent of rubber and vulcanized, has reached 5,000 to 6,000. Without vulcanization, paper containing 2 per cent of rubber often has a folding number of 2,000 and over.

# New Equipment for Rubber Factories

## Royle Offers Improved Tuber

JOHN ROYLE & SONS, Paterson, N. J., have recently announced the improvement of their 2-inch tuber by a change to the use of an enclosed Cleveland




**Rear View Showing Motor Attached on Feeding Side**

worm gear drive. To suit certain shop arrangements it has been found desirable to make the motor base interchangeable to either side of the machine and to extend the worm shaft for connection at either side. The shaft extension as shown in the accompanying illustration is covered by a tubular guard.

A covered chain drive has been arranged to operate an oil pump. This pump sprays a continuous stream of lubricating oil upon the point of contact of the driving gear. The oil is supplied from a large reservoir of 14-gallon capacity in the pedestal of the machine, circulating positively and returning by drip. It is cooled by a cold water coil, supplementing the cooling effect of the large quantity of oil in the machine reservoir. Timken roller bearings are used in the thrust.

The effect of the changes is to speed up the operation of the machine and render it more adaptable to various shop situations. In addition to the machine as arranged for plain tubing work it can be had with soapstone head and tank for thin walled tubing or with an insulating head of either straight or side delivery for covering wire and other rubber coated products.

## Nagle "Dreadnaught" Tuber

THE new 10" Dreadnaught Tuber recently offered to the trade by the Nagle Machine Co., Erie, Pa., is especially designed for heavy duty service. An important advantage claimed is the accessibility of all parts.

The machine is driven through a double reduction herringbone gear drive directly connected to the stock screw by means of a jaw clutch. This clutch is of the heavy duty type with hardened steel jaws to compensate for wear, and one half is split and bolted together to facilitate its removal.

The complete assembly is fully enclosed in a sheet iron guard. The tuber cylinder is bushed with semi-steel bushing which can be replaced at any time in case of wear. The cylinder head is threaded to take dies for different classes of work and provided with adjusting screws for centralizing cores when running hollow stock.

The stock screw is made from a solid steel forging, hollow bored for water circulation, ground and polished. This screw is designed for automatic ribbon feed.

Provision has been made on this machine for a wide variation of temperature control. Two separate jackets in the cylinder and one in the head makes it possible to obtain a wide variation in temperature between feed pocket and die head.

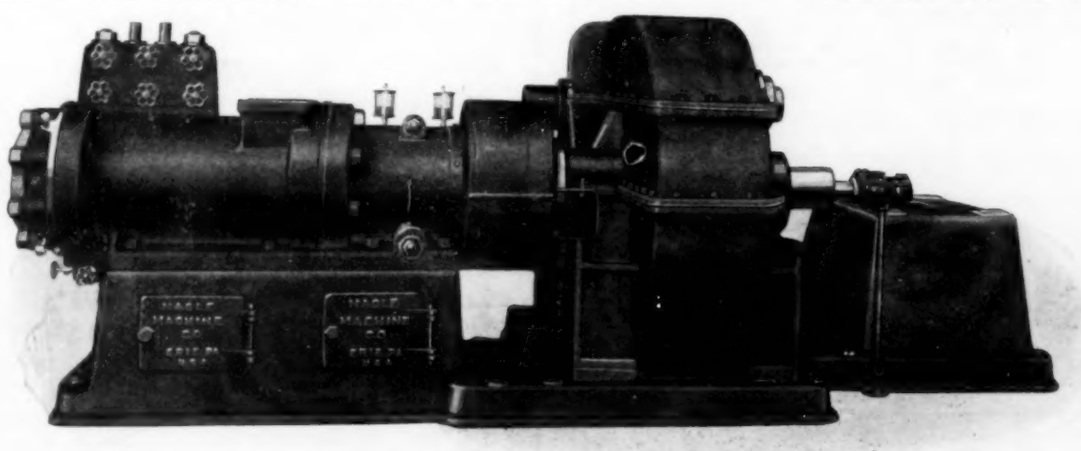
The manufacturers claim that this type of machine, with reduction gear unit directed to stock screw, is best adapted to the larger sizes of tubers and strainers such as the 10", 12" and larger sizes.

## New Foot-Operated Spreader

The Manley Manufacturing Company, York, Pa., have developed a new type foot-operated tire spreader, which they have recently introduced on the market. The new

**Manley Tire Spreader**

spreader will handle all sizes of balloon tires from the smallest up to 7½ inch diameter. It is simple in design and operation and provides an easy method by which casings can be spread open from bead to bead without injury and without adjustment. The machine is built with a heavy iron platen over which the casing is spread The foot treadle is supported in the rear steel leg and is connected to the arms by links, which gives considerable power with little effort. Small rollers mounted on strong springs protrude through the platen which allows the casing to be turned easily and which are depressed below the surface of the platen when the casing is spread open.



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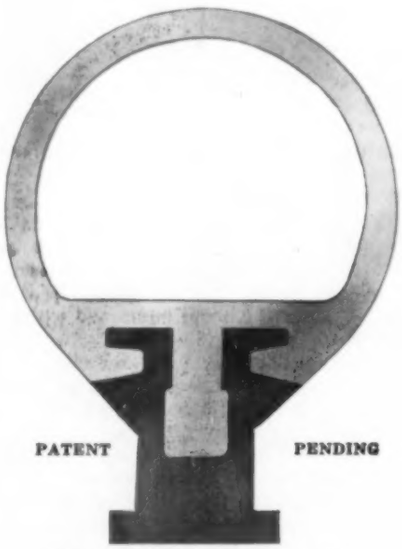


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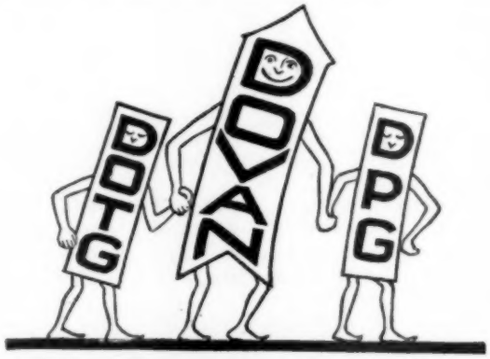


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# EDITORIAL COMMENT

## Good Roads and Tires

NO less than $1,918 yearly may be saved on tires for each mile of high type pavement that replaces gravel or macadam roads, according to a recent service bulletin of the Iowa Highway Commission, which takes as a basis the recent investigation of Washington State College. This means that where automobile traffic is heavy, the saving in the tire wear alone justifies paving.

Tread rubber on the average tire cost about $10 per pound when the survey was made. The amount of rubber worn off during the life of the average tire is about 3.45 pounds. It was found that on a good crushed stone macadam surface with 500 vehicles traveling over it daily the tire wear cost in the course of a year is $2,590 per mile. The cost on rigid pavements with the same number of vehicles is only $672.

A greater volume of traffic indicates an even greater need for pavements. Where 2,500 vehicles travel daily over a mile of road, which is not uncommon nowadays, the saving will be five times as great, or $9,590. With concrete pavements costing about $30,000 per mile, the pavement will be paid for by tire saving alone in three years.

On first glance it might appear that the construction of good roads would be unfavorable to the tire industry since they effect so considerable a reduction in the number of tires needed. Actually, however, good roads are the best friends of the tire industry, for they not only induce practically every motorist to drive more miles, but popularize the motor car as well. The result is that there is a constantly broadening market for tires as more and more good roads are built.

## Stabilization at the Bottom

FROM the viewpoint of the economist it can be fairly said that the rubber industry has reached a position of rock-bottom levels as regards commodity prices of manufactured articles and the costs of the basic raw materials. It is fair to assume that tires and other rubber goods cannot decline in price much below the present record low prices. Nor is it expected, especially in view of the present improved statistical position of the raw commodity, that crude rubber will fall much below the 19-cent level which has prevailed for the last month and a half. Even though the market receives a large accumulated tonnage on November 1 the visible stocks on hand will not be disproportionate to the present rate of absorption, and while there may be a temporary set-back in the market, well informed rubber traders doubt if any lower levels would be long maintained.

This rock-bottom level which the rubber industry can therefore be said to have reached is in effect a stabilization which may mean much to the industry at this time. Balance sheets of the manufacturing companies are expected to show a marked decline in net earnings for the first half of the current year by reason of the recent cut on tire prices, the drop in value of crude rubber stocks and the bad automobile touring weather which has curtailed tire sales. But even with inventory losses written off, with crude rubber at its present low levels and finished merchandise at prevailing prices, the companies are for the most part going to show a slight profit. Some of them are going to earn their entire dividend requirements.

Under the circumstances, therefore, and if this period of fair stabilization continues, the next six months of the year hold out considerable promise to the industry as a whole.

## Installment Selling Abroad

INSTALLMENT selling, always an important factor in the automotive industry of the United States and lately accepted as regular practice in the tire trade also, is said to be principally responsible for the remarkable expansion which has taken place in the European automotive industry since the war. This observation has been made by trade scouts of the Department of Commerce stationed in Europe.

More than 60 per cent of the 553,000 automotive units sold in Europe last year were handled on the installment purchase plan. This proportion compares favorably with that of the passenger cars sold in the United States during the same period, which was around 64 per cent. Some parts of Europe embraced installment buying long ago; other parts are just adopting it. The tire industry of the United States, with its export trade in mind, has long looked for a real expansion in European motoring. The partial payment plan may supply the answer.

The RUBBER AGE

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# NEWS of the INDUSTRY

*Financial—Business*
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## RUBBER EXCHANGE TO DEAL IN NEW GRADES

**Members Approve Change in By-Laws to Permit Trading in Blanket Crepe and Brown Grades of Rubber—To Go Into Effect September 1.**

THE amendments to the by-laws of the Rubber Exchange of New York, Inc., providing for trading in certain blanket and brown grades of plantation rubber, and which had the previous endorsement of the board of governors, were voted upon favorably by the members of the Exchange on July 12 and will go into effect on the floor of the Exchange on September 1.

The amendments will increase the number of grades tenderable against contracts so that they will include approximately 90 per cent of the world production of crude rubber. The new ruling adds six grades to the grades already traded in and provides for a second contract to be known as Contract "BB" as distinguished from the present "A" contract covering the standard grades.

The grades which may be delivered against "BB" contracts follow: A. B. C. and D. blanket crepes and No. 1 and No. 2 brown crepes. The first two grades are deliverable at contract price and the other four at differentials to be fixed by the adjustment committee on the fifteenth day of each month.

While the new grades are sub-standard so far as the standard grades tenderable against the exchange "A" contract are concerned, they are not lower grades in the sense of being inferior quality. The new grades merely differ in types and color.

The effect of the new by-laws will be to greatly widen the activities of the Exchange. F. H. Henderson, president of the Exchange, said in explanation of the new rules:

"The board of governors felt that the inclusion of the new grades would promote a still wider interest in the Exchange on the part of manufacturers. It will provide an opportunity for the hedging of these grades by shippers which has not existed before.

"The consumption of the rubber covered by the new grades is approximately 150,000 tons out of a total consumption of about 400,000 in the United States."

### Ohio Rubber Expands

The Ohio Rubber Company, Willoughby, O., has recently purchased 60 acres of land immediately north of their present plant and it is reported that the company will expand their factory facilities in the near future. It is understood that they have already purchased approximately $65,000 worth of new machinery and equipment, including new mixing machines and a large press to be used in the manufacture of mats and rubber flooring.

At the present time the company is running on a 24-hour day and has 370 employees on the factory payroll.

## RUBBER MATS INSULATE TUNNEL COLLECTORS

Until recently the money collectors at the New Jersey end of the Holland tunnel under the Hudson River, connecting New York with New Jersey, have been complaining of static electric shocks when their hands touched those of motorists. At first it was thought strange that this phenomenon should be confined to the Jersey side but investigation disclosed that motor cars coming down the steep hill leading to the entrance generated the static electricity. When the driver handed his toll to the collector in the form of coin a mutual shock resulted. The annoyance has now been eradicated by the placing of rubber mats under the feet of the collectors.

## FISK LOSES IN TIRE FABRIC LITIGATION

The R. J. Caldwell Company, Inc., New York City, has been awarded a judgment for $101,350 and interest against the Connecticut Mills Company in a recent decision handed down by the Supreme Court of New York. The case was the outgrowth of the cancellation of a contract involving more than 4,000,000 pounds of tire fabric by the Fisk Rubber Company, in December, 1925. The judgment is for commissions which would have been earned by the Caldwell Company as agents for the Connecticut Mills if the contract had been carried out.

After cancelling the original contract the Fisk Rubber Company settled with the mills on the basis of the amount of profit they would have made had the contract continued to run and at the same time assumed all expenses and claims of any possible suit for commissions on the part of Caldwell & Co. As a consequence, while the decision in the recent case is directed against the Connecticut Mills, the payment of the judgment will fall to the Fisk Company.

## "ADVERTISING HAS NEWS VALUE"—O'NEIL

**President of General Tire & Rubber Speaks Before International Advertising Association—Timely Advertising Contributes to Daily News.**

SPEAKING before the newspaper section of the International Advertising Association, at their convention in Detroit, July 10, William O'Neil, president of the General Tire & Rubber Company, characterized newspaper advertising as an important contribution to the news of the day. The subject of his talk was "News Value in Advertising."

"With special reference to the rubber industry," he said, "tire advertising is 'news' just as much as it is advertising, so, too, is this true of advertising relating to all kinds of merchandise, in which the outstanding features are style, newness, betterment of service and economic value.

"Where these are elements of first interest to the consuming public they are important daily news and properly belong in that medium which has the greatest speed for imparting news. When it is told with speed, it is news—after that, if true, it is history.

"The news of a new style can be flashed through the newspaper to the greatest number of people in the shortest possible time and at the least possible cost.

"Tire style is news for men as the department store advertisement is news for women," he said. "A new automobile is news to both men and women. The cord tire was news. So was the balloon tire.

"There is a noticeable swing to quality buying in all goods. In tires one of the chief factors at present is the low cost of rubber. With tire prices at the present low level, first cost is no longer an obstacle even in the selection of the best. Tires are cheaper than wheat at 50 cents—than cotton at five cents—cheaper than before the war—cheaper than ever before, as a matter of fact there is today no such thing as a high price tire, and, gentlemen," Mr. O'Neil emphasized, "that is news, welcome news, and requires the speed and size of a newspaper to get it across."

### Century Offers New Lines

In order to take care of the introduction of new types of heavy-duty, high-speed balloons and new sizes, the Century Tire Company, Chicago, Ill., has recently completed extensive additions to its plant. An active sales development campaign on the new products has been announced which, it is reported, is already showing satisfactory results. Under the new production schedule the output is being doubled.

## COURT ORDERS REHEARING IN TIRE FLAP LITIGATION

The Walten tire flap case which has been the subject of recent litigation under the title of Tingley & Company, et al., appellants vs Badger Rubber Works, appellee, will again be reheard according to the latest decision of the Circuit Court of Appeals for the Seventh District, which has reversed the decision of the District Court, throwing the case out of court on the ground of its unpatentability, and ordering a reopening of the case to determine whether the novelty has patentable value.

The action was first started by Tingley & Company, which had secured the Walten patent, against the Badger Company, which had begun producing a similar flap shortly after the patent was granted.

The patented device is one which is familiar to the trade and consists of a full-length flap with a perforation at one end to fit over the valve and is provided with marks on the other end showing where perforations should be made for various sizes of tires, and the court in reversing the lower court expressed the opinion that so much that is new and useful appears on the face of the patent that it was an error to determine without a hearing whether the device is not legitimately patentable.

The case will now go back to the District Court for the eastern district of Wisconsin for rehearing.

### Newton Falls Plant Sold

The old plant of the Newton Falls Rubber Company, Newton Falls, O., is reported to have been sold to Milton Mackey, of Pittsburgh, Pa., and it is understood that the manufacture of tires will be started at the factory at an early date. The original plant, first built about ten years ago, was known as the Made-Rite Tire & Rubber Company. Since then it has changed hands several times.

## H. HOUGH RETURNS TO HIS FORMER FIRM

It is reported that Harry Hough, former president of B. F. Goodrich Company, has become a member of Stagg, Mather & Company, public accountants, of New York City. Mr. Hough was associated with this concern prior to his affiliation with Goodrich. It is understood that the new firm will be known as Stagg, Mather & Hough. The company has offices in Newark, N. J., Havana, Cuba, San Juan, P. R., and Paris, but Mr. Hough will be located at the main office in New York.

### New Carlisle Tube

The Carlisle Tire & Rubber Company, Carlisle, Pa., has introduced on the market a new inner tube under the trade name of the "Car-mo-jon Super-bilt" tube, which, according to the announcement of the company, is guaranteed against defects of material and workmanship for six years. It is claimed to be heat and pinch proof and is built to fit the casings under load, being elliptoid in shape. The new tube is made in all sizes.

## BIDS ON DIRIGIBLES TO BE OPENED AUG. 9

The United States Navy Department is expected to open bids for the construction of two large dirigible airships on August 9 and confidence is expressed at Akron that the contract will be awarded to the Goodyear Tire & Rubber Company.

After it had been practically decided last year to award the contract to Goodyear, the bids were reopened on the strength of protests from the American Brown-Boveri Company, Camden, N. J. The competition this time is between these two companies.

The Goodyear Company has submitted two bids, one for the construction of two dirigibles at a cost of approximately $8,000,000 and the other calling for only one ship at $5,500,000. The Brown-Boveri figures have not been made public. The ships will be designed along the specifications drawn up by Goodyear and approved by the Navy Department. The chief fact in favor of the award going to the Goodyear Company is that it is the only company which, through its subsidiary, the Goodyear-Zeppelin Corporation, is in a position to begin immediate work on the contract. The Brown-Boveri Company has been, up to this time, chiefly a ship-building concern.

Two new non-rigid type airships are now being built by Goodyear for the United States army. They are designated as the TC type by the army and will be used for training pilots in the lighter-than-air branch of the aviation service.

## ARMY BALLOON WINS IN INTERNATIONAL RACE

The international balloon race for the Gordon Bennett trophy, held from Detroit, June 30, has been won by the United States army pilots, Capt. W. E. Kepner and Lieut. W. O. Eareckson. Their distance as officially scaled by the Geological Survey was 460.9 miles. The landing was made three miles southeast of Kenbridge, Va.

The army pilots had previously captured the Litchfield trophy as winners of the national balloon race from Pittsburgh on May 30.

The race was closely contested, the second balloon landing at a distance only a mile and a half short of the winners.

## Carrier Corporation Buys Additional Plant

THE Carrier Engineering Corporation, specialists in air conditioning, drying, processing and refrigeration, have announced the purchase of the four-story factory and office building located at 850 Frelinghuysen Avenue, Newark, New Jersey. The building was formerly occupied by the Edison Lamp Works division of the General Electric Company. The new location is only a short distance from the present plant.

The entire fourth floor is to be devoted to the general engineering and executive offices of the firm. The Carrier Construction Company, which is the manufacturing division of the firm, will occupy a large share of the space. The Experimental and Research Laboratories will be provided with largely increased space and facilities.

The manufacture and assembly of Carrier Centrifugal Refrigeration equipment, which is used extensively in connection with the air conditioning installations, will continue at the present location.

The transfer to the new quarters will take place prior to August 1.

The Carrier Engineering Corporation was founded under the leadership of W. H. Carrier and J. I. Lyle in 1915.

The Cincinnati Rubber Manufacturing Company, Cincinnati, O., manufacturers of mechanical rubber goods, have issued an announcement to the trade, through L. P. Darnell, in charge of sales, that due to the favorable prices at which they have been able to secure their crude rubber, a reduction averaging 5 per cent has been made in prices on items containing rubber and fabric and somewhat more on items containing a larger proportion of crude rubber.

CATALPO!

## TIRE COMPANIES GIVE UP BILLBOARD ADVERTISING

Through the campaign efforts of the General Federation of Women's Clubs to "Save the beauty of America" by eliminating the unsightly billboard on national and state highways, nine rubber tire manufacturers have endorsed the idea and withdrawn from the field of billboard advertising. The Hood Rubber Company has discontinued the use of over 700 of these boards. The Hood Tire Company states that it "does not think the giving up of rural boards has in any way retarded progress of the Hood Rubber Company."

The B. F. Goodrich Company writes: "At one time our company had many hundred painted bulletin boards scattered along the highways of the country, but these have been replaced by the poster showings in commercial centers, in localities of 50,000 population and up."

The Fisk Rubber Company writes: "We are using no painted boards. We confine our outdoor displays to posters on commercial sites aside from the signs which are displayed on the dealer building."

The following tire manufacturers are listed by the federation as sponsoring their plan:

Falls Rubber Company, Fisk Rubber Company, Gates Rubber Company, B. F. Goodrich Rubber Company, Hood Rubber Company, Kelly-Springfield Tire Company, Mason Tire and Rubber Company, Mohawk Rubber Company, Norwalk Tire and Rubber Company.

## PROMINENT MEN TO TALK AT N. T. D. A. CONVENTION

A number of men of prominence are scheduled to be on the program of the Boston Convention of the National Tire Dealers' Association, to be held November 20-22. They include General Lincoln C. Andrews, director general of The Rubber Institute, Inc., Roger Babson, well-known financial authority, Frederic Hood, president of the Hood Rubber Company, and Dr. Samuel Stratton, president of the Massachusetts Institute of Technology. The Boston committee is preparing an entertaining program.

In line with the co-operative advertising campaign which was approved at the last convention of the Association, a series of advertisements for individual dealers have been prepared and are being distributed to all members.

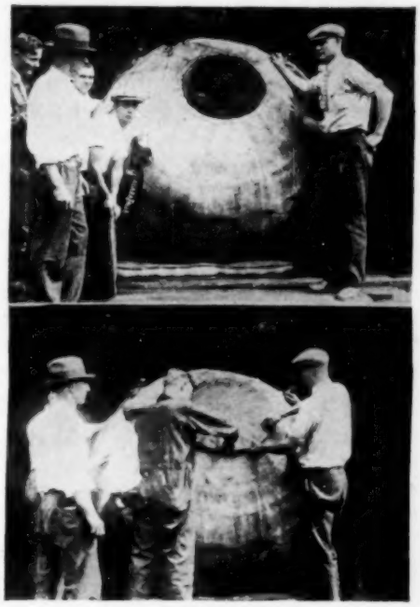
## AGENCY ESTABLISHED FOR RUBBER TESTING MACHINES

The firm of H. Z. Schniewind, 72 Duane street, New York City, agents for paper and textile testing machinery, have recently acquired the exclusive agency covering the United States and Canada for the well-known Schopper line of rubber testing machinery, manufactured by Louis Schopper, of Leipzig, Germany. Mr. Schniewind has been established in business in New York since 1919. He is a member of the American Society for Testing Materials and was at one time closely identified with the Bureau of Standards, at Washington, D. C.

The Schopper rubber testing machines have not heretofore been handled directly by any agency in this country but have won a wide reputation in the industry. Mr. Schniewind plans to establish a showroom at his New York office, where he will carry a full line of the testing apparatus.

## Shooting Niagara in a Rubber Ball

THE "shooting" of Niagara Falls by Jean A. Lussier, on July 4, was done in the huge rubber ball shown in the accompanying photographs. The framework of the ball was made by the Kasch Roofing Company, of Akron, and the rubber fabric covering was supplied by the Mohawk Rubber Company. The ball was constructed by Lussier and an assistant in a shop set up near the Mohawk factory. When completed its total weight was 758 pounds.



**The Ball Being Closed Just Before the Plunge**

Lussier started his daring feat from a few hundred yards above the Horseshoe Falls on the Canadian side. The ball was towed into the stream by a motorboat and cut loose. As it reached the brink of the precipice it was shot out into space as if by a catapult and struck the water below with terrific force, bouncing four or five times and barely missed the jagged rocks as it was whirled along. It was seized by a man in a rowboat in the lower river and towed to the bank. When the covering was slit open, Lussier was found sitting inside smiling.

He is said to have spent about $7,000 on the venture, but estimates that the stunt was worth $200,000 in financial returns according to the prizes which had been offered. A soft drink company and a cigarette concern had standing offers of cash prizes to anyone who went over the Falls and drank a bottle of their product or smoked a cigarette after the experience. Motion picture and vaudeville contracts also awaited the daredevil.

## 30,000 Airplanes in 1931

IT has been estimated by Major Lester Gardner, president of the Aeronautical Industries, Inc., who has recently returned from a visit to many of the leading aircraft factories in the central and eastern states, that there will be 30,000 airplanes in use in the United States by the end of 1930.

This would be an increase of between 600 and 700 per cent over the number of planes now in use. He believes that 5,200 airplanes will be constructed in this year, 10,000 in 1929, and 15,000 in 1930, which with the normal rate of loss, will leave about 30,000 planes in use in 1931. The only present limitation on the sale and production of planes is the engine situation.

## Goodrich Buys Airplane

The B. F. Goodrich Company, Akron, have purchased a five-passenger Wright-powered monoplane from the Fairchild Aviation Corporation, which will be used to expedite business trips, mail deliveries and surveys. The plane, which weighs 3,600 pounds when fully loaded, has a standard folding wing arrangement, a 220-horsepower Wright Whirlwind motor and a speed of 120 miles per hour under a full load. On its last trial trip it made a non-stop flight from Farmingdale, Long Island, to Akron.

## THINKS AKRON AT PEAK IN RUBBER MANUFACTURE

It is doubtful if Akron will see any further major expansion in its rubber industries, according to Francis Seiberling, in a speech before the Lions Club of Akron. In explaining his viewpoint he said that the rubber industry was being decentralized rather than further concentrated and that such decentralization was pimarily due to the change in policy of Great Britain from free trade to protection. The immediate result of the change in British policy was the establishment of two American factories in England and one in Australia.

"In addition," said Mr. Seiberling, "two factories have been put up in Los Angeles where far eastern crude rubber can be converted into tires for the Pacific coast markets, thus eliminating the long haul of crude rubber and tires across the country and back."

The New York Belting & Packing Company, Passaic, N. J., manufacturers of mechanical rubber goods, have announced plans for a new three-story addition at Second and South Streets, Passaic. Work will be started shortly.

The Stetson Rubber Company, East Butler, Pa., recently organized by H. B. Callahan, general manager of the Corona Cord Tire Company, Butler, Pa., have plans under way for the construction of a local factory for the production of retreaded tires and kindred rubber goods. The building will be a three-story structure and will be erected at an estimated cost of $85,000.

## CHEMICAL CHAMBER OF COMMERCE PROPOSED

A SURVEY has been recently made of the chemical industry in the United States by *Chemical Markets* to determine the sentiment of the trade as to the efficacy of establishing a national chemical chamber of commerce. A compilation of the returns from the questionnaire sent to over 1,000 executives in the industry indicates that a large majority of manufacturers would support such an organization. Some of the replies received from the manufacturers serving the rubber industry were as follows:

G. C. Bailey, Roessler & Hasslacher Company, favors the project because the "United States chemical industry is facing a foreign cartel which is becoming nearly a world-wide monopoly."

John A. Chew, Warner Chemical Company: "The industry certainly needs strength to meet the many problems that are arising."

William M. Whitten, Jr., E. I. DuPont de Nemours Company: "There seems to be a need for an organization able to speak with authority and to oppose effectively unfair competition practices, especially foreign competitive methods."

W. M. Bralton, Eagle-Picher Lead Company: "It would be a great benefit to common interests and promote better understanding."

C. R. Johnson, of Godfrey L. Cabot, Inc., is in favor of such a plan, "not to replace specialized associations but to handle problems common to the entire chemical industry."

## TIRE SWINDLER CAUGHT SELLING U. S. TIRES

In line with the campaign carried on by the Better Business Bureau against the sale of old or reconditioned tires as new ones under standard brand names, the United States Rubber Company was able recently to bring about the arrest and conviction of Joseph Remere, of New York, for representing merchandise illegally.

Remere's scheme is said to have been to draw a truck alongside a passenger car in traffic and ask a motorist whether he would like to purchase U. S. Royal Cord tires, according to Morris Dry and H. L. Fates, attorneys for the United States Rubber Company. Remere and his accomplices, the rubber counsel say, would offer to sell two tires, wrapped in paper, for $25.

When the prospective purchaser showed disbelief of their statement as to the make of the tire, they would tear aside some of the paper wrapping and show the "U. S." stamp on the tire. If the motorist bought the tire he would find upon examining them that they were battered, used tires and the "U. S." was part of the stamp "made in the U. S."

At the court hearing of Remerro, at which he was held over for Special Sessions, Abraham Jendzewitz, a spectator, was also arrested and held for further hearing on the same charge. The latter was identified by Aaron Mesinger, also a spectator, who had come into court in the chance of being able to identify Remerro as the man who had also sold him a set of bad tires. Instead he saw Jendzewitz, whom he remembered as the guilty party and had him immediately arrested.

CATALPO!

With considerable new machinery installed and other machinery reconditioned, the Brown Rubber Company, Lafayette, Ind., has resumed the production of tires, after having been closed since November 1 last.

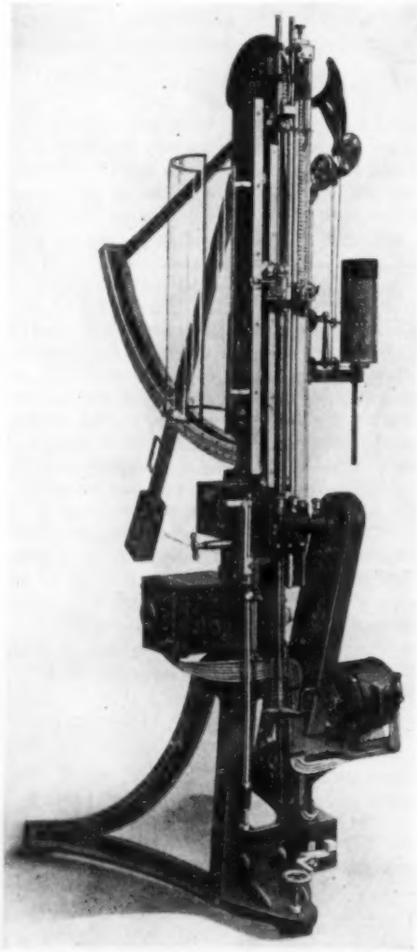
### General Offers New Tires

A new type of pneumatic tire and five new especial sizes of cushion tires have been announced by the General Tire & Rubber Company, Akron. The new pneumatic tire will be known as the center grip casing and is of four-ply construction with narrow bead for use on drop center rims. The tire is built especially for Fords and Chevrolets. The five new cushion tires include 32x6 nonskid, 40x16 nonskid, 36x8 rib tread, 36x9 nonskid and 36x10 nonskid. The last three are air center tires.

Additions to the factory of the National Tire and Rubber Company, East Palestine, O., have been completed which will permit of a production of 4,000 inner tubes per day. Company officials state that in spite of the fact that the plant is being run at capacity sales are running far ahead of production.

## Schopper-Dalen Rubber Testers

THE many rubber testing devices manufactured by the well-known firm of Louis Schopper, Leipzig, Germany, are now being placed on the American market through the agency of H. Z. Schniewind, 72 Duane street, New York City. An exclusive agency agreement covering the United States and Canada was effected only recently.



**Schopper-Dalen Rubber Testing Apparatus**

One of the principal products of the Leipzig firm is the Schopper-Dalen Rubber Tester, which has been recently greatly improved in a number of mechanical features and by the addition of a graphic recorder, by which an accurate and permanent record can be made of each test.

The machine is built along the same lines as the usual apparatus for paper or textile testing, the chief feature of the new machine and the one which differentiates it from the paper or textile testing type being the method of gripping and the shape of the sample. At the suggestoin of Professor Dalen a ring-shaped sample was adopted. The machine also has an ingenious device by which the test-ring is evenly rotated during the test so that every part of the sample ring is successively exposed to an equal strain. The manufacturers claim that the machine has no peer in testing for strength and elongation because of the use of this ring-shape rotating device.

The autographic recording attachment registers automatically the relation between strength and stretch at any moment during the test. Together with the strength and stretch indicators, the automatic recorder is automatically stopped when the test ring breaks. The autographic recorder also allows of obtaining hysteresis curves.

With the autographic recorder curves which are directly comparable can be made, although the cross section of the various rings tested may be different, provided, of course, that the rings be of the same material. Thus mistakes due to the use of rings of different sizes become impossible, and the record sheets can be compared independently of the cross section of the rings tested. The test rings are punched out of vulcanized sheets by means of punching machines specially designed by Schopper for the purpose. Moulds for vulcanizing sample sheets in the laboratory can also be obtained.

All Schopper testers can be supplied for water, belt or motor drive.

# *Names in the News*

CHARLES W. SEIBERLING, vice-president of the Seiberling Rubber Company, Akron, has been appointed chairman of a fact finding committee named by the City Council of Akron Northern Ohio Power & Light Company transportation situation.

WILLIAM WELSH, president and sales manager of the Rubber Reclaiming Company, Akron, was the speaker at the weekly luncheon of the Lions Club, in the club rooms in the People Savings & Banking Company building, June 27.

WILLIAM G. PICKREL, lieutenant governor of Ohio, is also one of the board of directors of the Dayton Rubber Manufacturing Company. Dayton, O.

JOHN BIERER, technical superintendent of the Boston Woven Hose & Rubber Company, Boston, Mass., has been named as advertising manager for the general program of the September meeting of the American Chemical Company.

JAMES H. STEDMAN, president of Stedman Products Company, South Braintree, Mass., recently addressed the Catholic Hospital Convention, at Cincinnati, O., on the subject of rubber flooring.

JOHN H. MULLOY, who recently resigned as mechanical supervisor of the Detroit branch of the United States Rubber Company to become vice-president and general manager of the Organ-Oxide Products Company, was tendered a testimonial dinner by the executives, superintendents and foremen of his old company. Mr. Mulloy leaves the company after 34 years of service.

WILLIAM B. TRAINER has been elected vice-president of the firm of Speck-Marshall Company, of Pittsburgh.

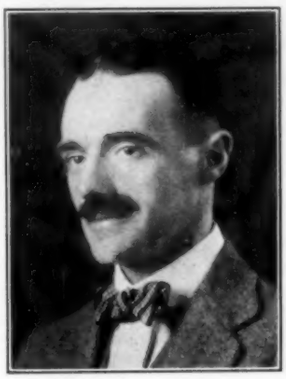
BENJAMIN F. COOMBS, in the sales department of the Republic Rubber Company, Youngstown, O., has been transferred to the Chicago branch office of his company. While at the factory he specialized in belt engineering and in his new post he will sell and advise power users in that line.

P. W. LITCHFIELD, president of the Goodyear Tire & Rubber Company, sailed this week on the S. S. *Franconia* from New York for a month's business trip to Europe.

HOWARD SMITH, western sales manager of the General Tire & Rubber Company, returned to Akron recently after an extensive trip through the western territory. He reported a general improvement in the tire business throughout his district and the addition of 16 General tire dealers.

ROBERT M. PIERSON, organizer of the legal department of the B. F. Goodrich Company, Akron, and patent attorney of the company since 1912, has resigned to enter the private practice of law. He will remain in Akron and have his offices in the Akron Savings & Loan Building. His successor in the Goodrich Company will be W. D. EAKIN, a member of the legal staff who has cooperated with him during his connection with the organization.

G. S. WHITBY, professor at McGill University, Montreal, and well-known in rubber circles for his many scientific researches in rubber technology, has recently had the



**G. S. Whitby**

honor of having the title of "Officer d'Academie" conferred upon him by the French Government for his services in the field of science.

R. D. WILHELM, of the Firestone Tire & Rubber Company, recently received the largest award ever made for a suggestion at the Firestone plant, for his recommendation covering an improvement in the production of tubes. The amount of the award was $800.

DR. HANS EBNER, of Berlin, Germany, was a recent visitor to the Goodyear-Zeppelin Company, Akron, where he consulted with DR. KARL ARNSTEIN, vice-president of the company, on problems of structural safety of airships. Dr. Ebner will spend several weeks at the Goodyear plant before returning to Germany.

B. M. MITCHELL, president of the Conveying Weigher Company of New York City and consulting engineer of the Manhattan Rubber Manufacturing Company, of Passaic, N. J., has been elected an honorary and life member of the American Society of Mechanical Engineers.

LYNN HARVEY, manager of tire sales of the Dayton Rubber Manufacturing Company, Dayton, O., has been busy in the New England territory where he has been advising dealers on the company's new tire insurance plan.

O. S. SLEEPER, formerly of the O. S. Sleeper Company and until his present connection associated with the Buffalo Foundry and Machine Company, has been appointed chief engineer of the H. G. Trout Company. Buffalo, N. Y., manufacturers of chemical equipment and vacuum apparatus.

ALBERT L. BOWMAN, who has been with the tire and rim sales division of the Goodyear Tire & Rubber Company, Akron, for the last 13 years, has resigned to join the commercial tire sales division of the Miller Rubber Company. Mr. Bowman is a veteran of 24 years' experience in the rubber industry. He is considered an authority on commercial tires and rims.

WILLIAM OGDEN HADLEY, general manager of the Saint Louis Cement Company, St. Louis, Mo., on June 14 celebrated his 60th birthday and his 46th year of service in the rubber industry.

E. S ROGERS has resigned as president and treasurer of the Electric Vulcanizing Rubber Company, of Cleveland, O.

ARTHUR ILLENBERGER, who has been traveling among eastern distributors for the General Tire & Rubber Company, has been transferred to the Chicago office for sales promotion work.

HUGH W. FULTON, of Glasgow, Scotland, and son of the managing director of the Albion Motor Car Company, Ltd., of Great Britain, has recently arrived in Akron and will take a course in tire repairing in the school of the Goodyear Tire & Rubber Company.

R. D. WOOLERY, factory superintendent of the Polson Rubber Company, Garrettsville, O., was elected secretary and treasurer of the organization at a recent meeting of the board of directors. The promotion of Mr. Woolery is in recognition of the important part he has played in the development of the company during his thirteen years of service.

W. H. BUSHNELL, traveling field representative for the technical service department of the United States Rubber Company, has been spending some time in the middle west among his company's distributors.

CHARLES SAMPSON, manager of the accessories and repair materials department of Kelly-Springfield Tire Company, has been re-elected chairman of the accessories and repair materials division of the Rubber Association of America, Inc.

C. E. BISHOP, consulting engineer and head of the Bishop Engineering Company, specialists in rubber reclaiming, has moved from 19 Goodyear avenue, Akron, to 1124 Vernon street, Dayton, O.

C. J. DURBIN, sales manager of the Polson Rubber Company, Garrettsville, O., has recently returned from an extended visit to his company's distributors in the south.

ERNEST I. KILCUP, assistant secretary and treasurer of the Davol Rubber Company, Providence, R. I., has been re-elected as a director of the National Association of Credit Men.

# Timely Financial News

## CANADIAN GOODYEAR IN STRONG POSITION

**Report of First Nine Months of Fiscal Year Shows Gain in Earnings—Company Has No Funded Debt and Common Stock is on $5.00 Annual Basis.**

THE report of the Goodyear Tire & Rubber Company of Canada, Ltd., for the first nine months of their fiscal year which ends September 30, is expected to show a net profit in excess of earnings for the corresponding period last year, according to C. H. Carlisle, president of the concern. This profit will be after all charges have been deducted and losses in inventory, occasioned by the sharp drop in crude rubber prices.

In view of the fact that the remaining three months of the fiscal year are the best from the viewpoint of tire sales it would seem that the year will be ended with a substantial profit over last year's figure, which was $2,171,391 or $11.26 per share.

The company has no funded debt, the outstanding capital consisting solely of 79,498 shares of 7 per cent cumulative preferred and 133,299 shares of no-par common. Following the recapitalization of the company in 1927, quarterly dividends of $1.75 were instituted on the preferred stock while the common stock was placed on a $5.00 basis and quarterly dividends of $1.25 have been paid since. The Goodyear Tire & Rubber Company, Akron, owns approximately 8,350 shares of preferred and 101,358 shares of common stock in the Canadian Company.

In a letter to stockholders, C. H. Carlisle, president, says: "Notwithstanding additions made to plant and equipment last year, all three of your plants are operating at maximum capacity. Both dealers' and car manufacturers' business shows a material gain over last year, and is the largest volume of business that your company has had.

"After allowing for loss caused by the decline in the crude rubber market, net profits for the nine months ended June 30, will show a very satisfactory increase over profits for the same period a year ago. Your company has no indebtedness, excepting current bills, not due for discount, and has a strong cash position."

### Fisk Declares Dividends

The Fisk Rubber Company recently declared the regular quarterly dividends of $1.75 per share on the first preferred and first convertible preferred, both payable August 1 to stockholders of record July 16. The regular dividend of $1.75 was also declared on the second convertible preferred, payable September 1 to stockholders of record August 15.

CATALPO!

## RUBBER COMPANY STOCKS SHOW SLIGHT ADVANCES

While a few of the stock issues of the various rubber manufacturing companies touched new low levels during the last fortnight, the majority of the stock list showed a slight improvement, although trading in rubber shares has been light. Reports that in spite of low net earnings most of the companies will show a small profit have a salutary effect.

Fisk hit a new low of 10⅞ during the last two weeks but rebounded quickly to 11¼. The same company's preferred issue also touched a new bottom at 66½. Goodyear and Hood made similar declines but have shown signs of a reaction to higher levels. The only new high established during the last two weeks has been in the case of Mohawk preferred which went to 87.

The market for rubber stocks in general has been steady with India Tire & Rubber showing the only sensational gain, closing on July 19 at 35⅞ on the last recorded sale. The movement in India is in the absence of any official statement concerning refinancing but rumors persist that something is in the offing which if it materializes will be of great advantage to the company. Mohawk has still been active, reaching as high as 150 during the last week but has not succeeded in beating its high record for the year of 165.

It is generally conceded that the rubber companies have, for the most part, taken their inventory losses over in full and applied them to the first half year and are therefore in an advantageous position to benefit from low priced crude rubber during the remaining half year.

### Late Stock Prices

| | Last Price July 5 | —1928— High | Low |
|---|---|---|---|
| Ajax | 8⅜ | 8⅛ | 14⅜ | 7½ |
| Firestone | 175 | 170 | 232 | 170 |
| do. 6% pfd. | 110 | 108½ | 112 | 109 |
| do. 7% pfd. | 109¼ | 109¼ | 111½ | 108 |
| Fisk | 11¼ | 12 | 17⅜ | 10⅞ |
| do. 1st pfd. | 66½ | 80 | 91½ | 66½ |
| General | 169 | 165 | 190 | 165 |
| do. pfd. | 95 | 98 | 111 | 98 |
| Goodrich | 73⅜ | 74⅛ | 99⅜ | 68½ |
| do. pfd. | 112 | 111 | 115 | 109½ |
| Goodyear Com. | 47⅞ | 48½ | 72½ | 45¼ |
| do. pr. pfd. | 93½ | 93⅞ | 99½ | 92½ |
| do. pfd. | 102 | — | 120 | 100 |
| Hood | 26½ | 27 | 43 | 26½ |
| India | 35⅝ | 29½ | 45 | 16 |
| Intercontinental | 10¾ | 8⅜ | 21⅝ | 8⅛ |
| Kelly Springfield | 19 | 19¼ | 27⅜ | 15 |
| do. 1st pfd. | 70 | 63¾ | 80 | 58 |
| do. 8% pfd. | — | — | 84 | 55¼ |
| Lee | 19 | 19¼ | 24½ | 17¼ |
| Miller | 19½ | 19 | 27½ | 18⅞ |
| do. pfd. | 81 | 76 | 97½ | 70 |
| Mohawk | 143 | 133 | 165 | 29¾ |
| do. pfd. | 87 | 85 | 87 | 55 |
| Selberling | 41 | 39 | 49½ | 35 |
| do. pfd. | 105 | 107 | 107¼ | 102 |
| U. S. Rubber | 30¼ | 29⅝ | 68¼ | 27 |
| do. pfd. | 60¼ | 57 | 109⅜ | 55 |
| U. S. Rubber Reclaiming Com. | — | — | 16½ | 11½ |

## RECEIVER APPOINTED FOR PHELPS TIRE CO.

**Receivership Applied for by Baird Rubber and Trading Co. on Claim of $20,000—Assets Listed at $480,000 and Liabilities $390,000.**

JUDGE JOHN RELLSTAB in the Federal Court, Newark, N. J., appointed Edward O'Byrne of Paterson, and William H. Dunn of Garfield, N. J., on July 9 as equity receivers for the Phelps Tire & Rubber Co. of Garfield, N. J., on application of the Baird Rubber & Trading Co., 233 Broadway, New York, a creditor in the sum of $20,000. The joint bond was put at $50,000. Mr. Dunn is treasurer of the Phelps Company. The bill of complaint states that the company is not insolvent, but that it lacks ready cash to carry on the business at the present time.

The liabilities were given as $390,000 and the assets at $480,000, the latter sum represented by accounts receivable, $130,000, and real estate, machinery, and merchandise of $350,000. The application was filed by David Bilder of Bilder & Bilder, Newark.

The Phelps Tire & Rubber Co. was organized December 27, 1924, and had a capitalization of $250,000 in preferred stock and 5,000 shares of common stock with no par value. Harry E. Phelps was President, Walther H. Grote was in charge of production and special sales, and G. H. Fisher was sales manager. The company manufactured the Batavia, Phelps and Phelps de Luxe lines of tires.

### Naugatuck Mills, Inc., Formed

The Naugatuck Mills, Inc., has been organized at Naugatuck, Conn., and has recently acquired the property rights of the old Dunham Mills, Inc. The new company is capitalized at $100,000 to manufacture cloth and deal in rubber, hemp, silk, cotton and a number of other fibers. The Dunham Mills used to make jersey cloth and knit linings for rubber shoes.

The main plant of the Ford Motor Company, at Fordson, Mich., is reported to be turning out 2,800 complete Model A cars per day and the company is still six months behind on orders. The plant is producing 3,100 engines per day.

Washington-Dean Company, Inc., crude rubber brokers of 18 Bridge street, New York City, have announced that W. M. Noble, formerly of the Firestone Tire & Rubber Company, will be in charge of the new Akron offices which are being opened in the Akron Savings & Loan Building.

The General Tire & Rubber Company recently declared a 3 per cent dividend to the common stock, payable August 1 to stockholders of record July 20. The common stock has a par value of $25 and is being quoted on the Cleveland Exchange at 170.

# Rubber Goods and Specialties

## Powder Bags

The E. I. duPont de Nemours & Company, Inc., have developed at the suggestion and in cooperation with mine operators, a bag to carry powder and dynamite, which can be easily transported by the miner and will withstand the destructive action of underground use. The bags are made either

Du Pont Powder Bags

in knapsack type or pouch type, of strong jute cloth treated and coated with a special rubber compound which makes them waterproof and resistant to fungus, dry rot, acid waters, vitiated air, and all similar underground conditions. The coating compound is also a non-conductor of electricity. They reduce the cost of carrying explosives to the face of the mine as well as greatly reduce the hazard of handling. The pouch type as shown in the photograph has a capacity of 50 sticks of dynamite. The bags are manufactured at the Fairfield, Connecticut, plant of the Du-Pont Company.

## Rocking Chair Tips

Elastic Chair Tips

A useful and practical rubber novelty which is enjoying a steady demand is the chair tip for rockers, manufactured by the Elastic Tip Company, Boston, Mass. They are particularly useful in protecting base boards and furniture from the sharp ends of rockers and are finding favor especially in summer hotels and porches where there is a considerable moving around of furniture. The device is durable and easily fitted to the rocker.

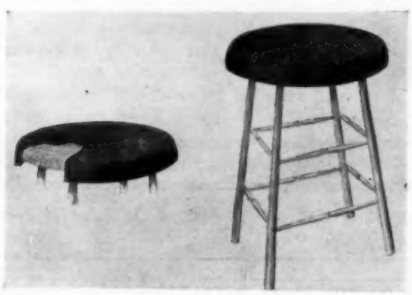
U. S. Rubber Chair Mat

## Circle Mats for Dentists

The United States Rubber Company is offering to the dental fraternity the "U. S." Circomat, designed to give relief from fatigue to the practicing dentist. The soft, springy rubber relieves the physical strain of standing hour after hour at the chair, the corrugated surface prevents slipping and the edge is beveled to obviate any danger of tripping. Circomats are regularly made in black or dark mahogany colors, but on special order can be supplied in light mahogany or gray. They are 72 inches in diameter and have either a 22-inch or 24-inch opening for the base of the chair. They are available in full-circle, half-circle, or in three-quarter circle, as shown in the illustration. The standard thickness is ¼ inch, but on special order can be made ⅛ or ⅜ inch.

## Stool Cushions

The Sun Rubber Company, Barberton, O., is offering to the trade in the form of its "Snugfit" stool cushion, a device which fits closely over the seat of the ordinary office stool and which should have a particular appeal to office workers, such as draughtsmen, bookkeepers, bank clerks and others.



Sun Rubber Stool Cushions

The core, as seen in the illustration, is of resilient sponge rubber of ample thickness to insure comfort on an otherwise hard seat. The drop sides hold it firmly in place. The device, besides promoting comfort, serves to save wear and shine on clothing. It is furnished in two sizes, in green felt only.

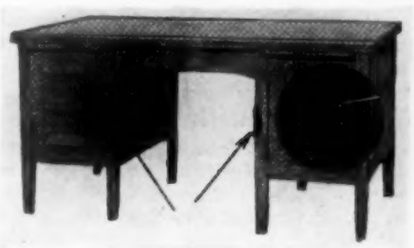
## Rubber Gasket Tubing

A comparatively new form of gasket packing, which is winning increasing favor in industrial plants, is now being offered the trade by Jenkins Brothers, New York City, manufacturers of mechanical rubber goods. It consists of tube rubber and is designed for packing hand-holes, man-holes, or any large steam joints of irregular shape. It is economical to use and can be fitted in large joints of any shape without waste. In quick repair work, where a steam packing

Jenkins Gasket Tubing

is required at once, the joint can be made with this tubing in the time ordinarily required to measure and cut a gasket from any of the sheetings. The tubing is made in 3/16, ½, 5/8, and ¾-inch diameters, in lengths of about 12 feet. It is packed in boxes together with a supply of plugs and adhesive tape. The directions for its use merely call for cutting the tubing with ends beveled, inserting the soft plug, one-half in each end and fitting the ends neatly together and wrapping the joint smoothly with the adhesive tape. The gasket is then ready for use.

## Rubber Desk Guards



Davidson Desk Guards

A rubber desk guard, designed not only to protect desks from being scratched by chairs but as a protection for clothing, ladies' hose and dresses from tearing on rough corners, is the latest product of the M. M. Davidson Company, 123 West Madison street, Chicago, Ill. The guards are made of soft rubber to match the color of the desk. They are supplied in cartons containing one complete set with tacks ready to be put on, at 75 cents per set. Their position on the desk is showin in the accompanying illustration.

# Current Crude Rubber Items

## TRADING ON EXCHANGE IS STEADY BUT DULL

**Market is Firm, With Prices Slightly Advanced — Speculative Interest is Absent—Lack of Confidence is Seen in Prices on Future Positions.**

TRADING on the Rubber Exchange of New York during the last fortnight has been extremely light and for the most part featureless. The tone has been steady, with very slight fluctuations between high and low extremes. What little trading has occurred has come from factory interests and has been for nearby positions. Speculative interest has been entirely absent.

By virtue of the decline in visible stocks and the steadiness in London, prices have slightly advanced. Stocks in London now represent barely one month's requirements of the manufacturing industry.

The high rate of consumption which has prevailed for the last two months and the decline in shipments from the east have also played a part in steadying the market. But with all the encouragement which this improvement in the statistical position gives to the trading fraternity the fear of just what will happen after November 1 still hovers over the market and serves to curb any real bullish sorties. The lack of confidence in the future market is still seen in the quotations on the distant future positions which in some instances are listed at lower prices than the nearby deliveries.

Arrivals this month are estimated at 28,000 tons and reports from the manufacturing industry would indicate that a high rate of production is continuing. Reports from the Far East, on the other hand, contain rumors that accumulations of stocks in anticipation of November 1 are already being made in substantial volume.

The table below indicate the daily fluctuations in prices on the Exchange and the daily volume of sales.

### Oil From Rubber Scrap

The Straits Budget, of Singapore, reports widespread interest at a gathering of Perak planters where a demonstration was given by David Graham, a local chemist, and R. W. Kendall, an estate manager, of their process for the cheap extraction of oil and spirit from rubber scrap. According to the demonstration the cost of producing rubber oil works out at 10 cents (Straits) per gallon. The process is simple. It was explained that health authorities have found rubber oil is more deadly than mineral oils when employed against mosquito larvae, and possibilities of rubber oil in malaria prevention are being discussed at a medical conference to be held shortly.

## EDISON INVENTS A "TAPPING" MACHINE

Harvey S. Firestone, Sr., is reported to have received a letter recently from Thomas A. Edison in which the electrical wizard states that he has perfected a "tapping" machine for the tapping of rubber trees on plantation estates. No details have been forthcoming from Mr. Edison as yet but if such a device is invented it will doubtless contribute much to decreasing labor overhead on large rubber plantations. Mr. Edison has also recently announced that among the many other plants which he has studied as a source for rubber, the common variety of golden-rod is one of the best suppliers of latex among the indiginous flora.

## FORD SHIP LEAVES FOR BRAZILIAN PLANTATION

The first Ford steamship, the "S. S. Lake Fargo," to establish contact with the Brazilian rubber plantation development of the Ford Company, left Detroit, via the Welland Canal, last week, loaded with a full cargo of supplies and equipment for the beginning of operations on the Tapajoz River. Machinery to do the initial construction work and the first clearing on the plantation, build sanitary quarters for staff and laborers and provide hospitalization are being carried on the vessel. The ship will stop at New York to complete loading and will then proceed direct to her destination, which is expected to be reached within 35 days after leaving New York.

## PRESENTS MEMORIAL TO LORD STEVENSON

The chancellor of the British exchequer, Winston Churchill, recently presented to the Dean and Chapter of St. Paul's Cathedral, London, four silver-gilt vases inscribed with the name of Lord Stevenson, in whose memory they were given by friends and members of the Rubber Growers' Association. They were designed by Sir Edwin Lutyens, R.A., for the High Altar of the cathedral.

Mr. Churchill referred to the late Lord Stevenson's services to his country, and Dean Inge returned thanks for the gift. Lady Stevenson and a number of people prominent in the rubber world were present at the ceremony.

The Rubber Growers' Association has also established a scholarship at Loretto School, which bears Lord Stevenson's name. The value of this scholarship is $650 per year, and it can only be given to the sons of men who have played a considerable part in the direction of public affairs in Great Britain or other parts of the Empire.

## MALAYAN EXPORTS DO NOT REACH JUNE QUOTA

In spite of the opposition to restriction and the complaints from rubber planters to be allowed to ship their full production, reports from British Malaya indicate that exports of crude rubber are not even reaching the amount permissible under the present 60 per cent standard production allowance. The amount of rubber exported from British Malaya in June totaled 22,930 tons.

The amount of rubber imported was 16,168 tons, of which 13,050 tons were declared as wet rubber. For the six months to date the gross exports amounted to 153,719 tons, and foreign imports to 75,890 tons, against 196,861 tons and 87,420 tons, respectively, for 1927. Exports in June to the United Kingdom were 2,947 tons, against 5,249 tons in May, while those to the United States were 15,617 tons, compared with 16,450 tons.

The board of governors of the Rubber Exchange of New York has approved the following price differentials between the various grades of hevea plantation rubber which shall prevail on all deliveries made during August against Exchange contracts:

Off quality first latex crepe, ½ cent per pound; good F. A. Q. ribbed smoked sheets, 3/10 cents per pound; ordinary F. A. Q. ribbed smoked sheets, 6/10 cents per pound.

## *Closing Prices on Rubber Exchange of New York, Inc.*

JULY 5 TO JULY 20, 1928

| | Date | Spot | July | Aug. | Sept. | Oct. | Nov. | Dec. | Jan. | Feb. | Mar. | Apr. | May | June | Sales* |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| July | 5 | 18.60 | 18.50 | 18.60 | 18.70 | 18.60 | 18.60 | 18.80 | 18.60 | 18.60 | 18.60 | 18.60 | 18.50 | 18.50 | 261 |
| | 6 | 18.60 | 18.60 | 18.70 | 18.80 | 18.70 | 18.70 | 18.70 | 18.60 | 18.60 | 18.60 | 18.60 | 18.70 | 18.70 | 138 |
| | 7 | 18.80 | 18.70 | 18.80 | 18.90 | 18.80 | 18.80 | 18.80 | 18.70 | 18.70 | 18.70 | 18.70 | 18.70 | 18.70 | 27 |
| | 9 | 18.90 | 18.80 | 18.90 | 19.00 | 18.90 | 18.80 | 18.90 | 18.80 | 18.80 | 18.70 | 18.80 | 18.80 | 18.80 | 269 |
| | 10 | 19.10 | 19.10 | 19.10 | 19.20 | 19.20 | 19.10 | 19.00 | 18.90 | 18.90 | 18.90 | 18.90 | 18.90 | 18.90 | 588 |
| | 11 | 19.10 | 19.10 | 19.10 | 19.10 | 19.00 | 19.00 | 19.00 | 18.80 | 18.80 | 18.80 | 18.80 | 18.80 | 18.80 | 200 |
| | 12 | 19.10 | 19.00 | 19.00 | 19.10 | 19.00 | 18.90 | 18.90 | 18.60 | 18.70 | 18.80 | 18.80 | 18.80 | 18.70 | 179 |
| | 13 | 19.00 | 19.10 | 19.10 | 19.10 | 19.00 | 19.00 | 19.00 | 18.70 | 18.70 | 18.80 | 18.80 | 18.80 | 18.80 | 272 |
| | 14 | 19.10 | 19.00 | 19.00 | 19.10 | 19.00 | 19.00 | 19.10 | 18.80 | 18.80 | 18.80 | 18.80 | 18.80 | 18.80 | 87 |
| | 16 | 19.30 | 19.20 | 19.20 | 19.10 | 19.20 | 19.20 | 19.10 | 18.90 | 18.90 | 19.00 | 19.00 | 19.00 | 19.00 | 719 |
| | 17 | 19.30 | 19.20 | 19.20 | 19.20 | 19.30 | 19.30 | 19.20 | 19.20 | 19.10 | 19.10 | 19.10 | 19.10 | 19.10 | 435 |
| | 18 | 19.30 | 19.20 | 19.20 | 19.10 | 19.20 | 19.20 | 19.10 | 19.10 | 19.00 | 19.00 | 19.00 | 19.00 | 19.00 | 206 |
| | 19 | 19.50 | 19.30 | 19.40 | 19.30 | 19.40 | 19.40 | 19.40 | 19.30 | 19.20 | 19.20 | 19.20 | 19.20 | 19.20 | 187 |
| | 20 | 19.50 | 19.40 | 19.40 | 19.40 | 19.40 | 19.40 | 19.50 | 19.30 | 19.30 | 19.30 | 19.30 | 19.30 | 19.30 | 369 |

*In lots of 2½ tons each

CATALPO!

# *Rubber News Around the World*

## NEW RUBBER LIFEBOATS EXHIBITED IN LONDON

A collection of rubber pneumatic life-saving apparatus resembling bright colored enormous bath toys recently covered the deck of the Cunard liner "Carmania" at a demonstration in the King George V. Dock, London, before a large gathering of prominent shipping experts and representatives, by Gustav Winkler, of Berlin.

There were portable rafts shaped like primitive coracles, and capable of being carried by a single man, to rubber boats with alternating banks of seats with a holding capacity of 40 men. They can be thrown down into the sea from a height of 60 feet without injury, and the larger boats are built on a bulkhead system of twelve compartments, which enables them to keep afloat, even when badly damaged.

One large model, which when lowered into the water was practically indistinguishable from an ordinary boat, and was equipped with a motor. The largest boat on view was inflated for action by four men on foot bellows in 4½ minutes.

The canvas-rubber rafts were first made for military pontoon purposes, but it is hoped to extend their use universally as supplementary to the lifeboats aboard ship.

## RUBBERWARE EXHIBITION TO BE HELD IN LONDON

The new Horticultural Hall, Westminster, London, will be the scene of another Rubberware Exhibition during the week from December 4 to 8, which promises to be on a larger scale than any rubber exhibit ever held in Great Britain. Every effort is being made to bring under one roof a representative display of every type of manufactured rubber goods. The exhibition is appropriately scheduled early in the Christmas season and is designed to aid the British manufacturer and retailer in increasing sales and popularizing rubber goods with the general public. The exhibit will be widely advertised in advance.

The arrangements and management will be in the hands of Greville Montgomery, who has promoted many of the large international rubber exhibitions in Europe.

## Scrap Rubber in Japan

It is estimated by dealers that the Japanese market now absorbs from 100 to 125 tons per month of scrap rubber, according to information reaching the Department of Commerce. The possibilities of a further expansion in this field are deemed excellent. At the present time scrap rubber imports are about 9 per cent as great as the imports of crude rubber.

It is reported that all of the usual methods of reclaiming are now being used in Japan but the most popular is apparently the sulphuric acid (Mitchell patent) method, although some of the more progressive firms are now using the alkali process (Marks patent).

Reclaimed rubber is used in Japan in the manufacture of bicycle and ricksha tires, rubber toys, druggists' rubber sundries, rubber footwear, miscellaneous rubber goods and in the manufacture of rubber soles for "zorii," or Japanese sandals.

## LONDON'S RUBBER ROAD SHOWS LITTLE DAMAGE

It is reported from London that for the first time since it was laid, in 1926, the experimental stretch of rubber roadway in New Bridge Street, E. C., London, has undergone repairs. They are said to be of minor character, however, and were not occasioned by fair wear and tear but by the damage caused by the broken axle of a motor lorry. Despite the heavy traffic, which has daily passed over the roadway, the rubber blocks show hardly any wear.

## COLONIAL SECRETARY ORMSBY-GORE RETURNS

Colonial Under-Secretary Ormsby-Gore has returned to London from his tour in Malaya, Ceylon and the Dutch East Indies. His trip, which began on March 15, included visits to Java, Malaya, the State of Johore, and Singapore, where he flew in an airplane over the city and visited the Base and harfor works. He also conferred with colonial governments regarding matters arising out of the imperial agricultural research conference and the recommendations of last year's colonial office conference.

In various speeches in Malaya he allowed himself greater freedom in talking on the rubber situation and upon his return expressed himself as confident of the security of the plantation industry, without the imposition of the restriction policy.

Germany's net imports of crude rubber during 1927 totaled 38,891 tons as compared with 22,775 tons in 1926 and 33,932 tons in 1925.

According to figures released by the Department of Commerce, Italy has exported approximately 178,605 automobile casings during the first quarter of the current year, as against 162,582 casings shipped in the corresponding period last year. Spain, India, and Australia are Italy's leading customers for tires.

The Goodyear Tyre and Rubber Company (Australia), Ltd., is building an addition to their plant at an expense of £36,000, which will enlarge the main factory by 18,000 square feet.

## RUBBER INDUSTRIES BILL GOES THROUGH COMMITTEE

The British Rubber Industries Bill, which provides for the collection from rubber manufacturers of contributions to the funds of the Research Association of British Rubber and Tire Manufacturers, and which has been reported upon a number of times in previous issues of THE RUBBER AGE, has just passed through the standing committee at the House of Commons.

A new clause defining the duties of the collector under the bill and a new schedule laying down a form of undertaking by the collector concerning the treatment of information as private, were added to the measure. The bill was ordered to be reported to the House, and there is now great hope of its being passed into law this session.

## June Rubber Imports

The Rubber Association of America, Inc., has compiled the following table covering the importations of crude rubber by various grades into the United States during June as compared to June a year ago and to May of the current year.

| | JUNE 1927 | JUNE 1928 | MAY 1928 |
|---|---|---|---|
| Plantations | 31,444 | 24,752 | 31,564 |
| Paras | 1,057 | 582 | 349 |
| Africans | 123 | 25 | 14 |
| Centrals | 251 | 9 | 5 |
| Guayule | 317 | 424 | 451 |
| Manicoba and Matto Grosso | 2 | — | — |
| Total | 33,194 | 25,792 | 32,883 |

Comparative figures showing the total importations for the first six months of 1928 and 1927 are as follows:

| | 1927 | 1927 |
|---|---|---|
| Plantations | 212,108 | 201,489 |
| Paras | 9,973 | 6,770 |
| Africans | 1,359 | 684 |
| Centrals | 1,634 | 377 |
| Guayule | 1,762 | 3,176 |
| Manicoba and Matto Grosso | 14 | 1 |
| Total | 226,850 | 212,497 |

## Praises Liberian Project

Press dispatches from West Africa report that the group of European rubber experts who are examining that region in the interests of rubber planting have spent considerable time at the Liberian properties of the Firestone Plantations Company and have spoken in high praise of the progress made and especially commend the enterprise of the company in road building, 200 miles of which have already been laid out.

Canadian tire manufacturing companies have announced price reductions in line with the recent cut in prices made by the American manufacturers.

CATALPO!

## RAINBOW INSTALLS TIRE MFG. EQUIPMENT

According to a recent announcement of Charles E. Ross, president and general manager of the Rainbow Tire & Rubber Company, which has general offices in Columbus, O., and a plant at Delaware, O., the tire making machinery and equipment will have been completely installed in the Delaware factory by August 1 and the company is expected to go into full tire production shortly thereafter.

The Rainbow plant was opened a year ago for the manufacture of the Ross Truss tube and was in operation until last June when work was temporarily suspended to permit of the installation of the new tire making machinery, with which it is planned to add a line of balloon tires to the products of the company. With the new machinery and the reorganization of the tube making part of the plant, the new production schedule will call for an output of 3,000 tubes and 1,500 tires per day, with the plant working on a two-shift basis.

The Swinehart Tire and Rubber Company, Akron, O., will hold its annual picnic on August 16, at Chippewa Lake, near Akron. The plant will be closed for the day and a big program of games and sports.

In describing the "baby-walker" manufactured by the Rockaway Manufacturing Company, in the last issue of THE RUBBER AGE, the address of the company was given in error as Cleveland. The proper address is 527 East Fifth Street, Cincinnati, O.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Randprint Rubber Sheet Gum cut to pattern for manufacturers

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# LATE MARKET PRICES

## Crude, Scrap & Reclaimed Rubber - Cottons and Fabrics

JULY 20, 1928

## COTTON

DURING the early part of the last fortnight the unfavorable weather and crop advices together with the reports of increasing weevil emergence brought the cotton market up to near the 23 cent level but within the last week the report issued by the Government showing an increase in cotton acreage of 11.4 per cent has caused a reaction. However, the situation from a trading standpoint is still very much unsettled and it is still too early to gauge the ultimate status of the crop. The easing off of the market has caused a return to hand-to-mouth buying in anticipation of still lower prices. European consumption continues at a high rate. The domestic mills, however, continue to have difficulty in merchandising their stocks at a satisfactory profit and there is therefore little interest in contracting for future deliveries of raw materials in any great volume, while there remains the possibility of purchasing at lower levels. High, low and closing quotations as of July 19 were as follows:

| | High | Low | Close | Close |
|---|---|---|---|---|
| | | July 19 | | July 5 |
| July | 21.34 | 20.89 | 21.06 | 21.85 |
| October | 21.58 | 21.09 | 21.24 | 22.00 |

## Tire Fabrics

Consumption of tire fabrics by the tire manufacturing industry amounted to 19,167,606 pounds during April, according to the Rubber Association of America. There has been a fair volume of sales reported during the last fortnight and prices have remain unchanged. The majority of transactions have been in Americans of staple and extra-staple lengths. Late prices are as follows:

| | | | |
|---|---|---|---|
| **CORD** | | | |
| Peeler, carded, 23/5/3 | lb. | .46 @ | .47 |
| Peeler, carded, 23/4/3 | lb. | .47½@ | .48½ |
| Peeler, carded, 13/3/3 | lb. | .43½@ | .44 |
| Peeler, carded, 15/3/3 | lb. | .44½@ | .45 |
| Egyptian, carded, 23/5/3 | lb. | .58 @ | .60 |
| Egyptian, combed, 23/5/3 | lb. | .60 @ | .61 |
| **CHAFERS** | | | |
| Carded, American, 8 oz. | lb. | .41 @ | .42 |
| Carded, American, 10 oz. | lb. | .41 @ | .42 |
| Carded American, 12 oz. | lb. | .42 @ | .44 |
| Carded American, 14 oz. | lb. | .40 @ | .44½ |
| **LENO BREAKER** | | | |
| Carded American, 8¼ oz. | lb. | .40 @ | .44 |
| Carded American, 10¼ oz. | lb. | .40 @ | .44 |
| **SQUARE WOVEN** | | | |
| Carded American, 17¼ oz. 23-11 ply | lb. | .46 @ | .47 |
| Carded American, 17¼ oz. 10-5 ply | lb. | .40 @ | .41 |

## Sheetings

The market in sheetings during the last fortnight has not been active although several sales have been reported in 40-inch construction 2.85-yard at 11½ cents and 3.75-yard at 9⅜ cents. In spite of the lack of demand, prices have advanced slightly in line with the raw cotton market. Late prices follow:

| | | | |
|---|---|---|---|
| 40-inch, 2.50-yard | yd. | .12¾@ | .13 |
| 40-inch, 2.85-yard | yd. | .11½@ | .11¾ |
| 40-inch, 3.15-yard | yd. | .12¼@ | .12⅜ |
| 40-inch, 3.60-yard | yd. | .09⅝@ | .10 |
| 40-inch, 3.75-yard | yd. | .09¼@ | .09½ |
| 40-inch, 4.25-yard | yd. | .08¼@ | .08½ |

## Ducks

The trading in ducks has been quiet for the last two weeks and prices in the absence of buying interest have remained the same as last reported. Such sales as were recorded was for small volume and to fill immediate needs. This lull in the duck trade has now continued for several weeks. Latest prices are as follows:

| | | | |
|---|---|---|---|
| Belting and Hose | lb. | .36 @ | .38 |
| Enameling | lb. | .36½@ | .39 |
| Single filling | lb. | .16½@ | .18 |
| Double filling | lb. | .18 @ | .19 |

## RECLAIMED RUBBER

The reclaimed rubber market is holding up in the face of continued low crude rubber prices. Last month showed a decrease in the amount of tonnage consumed by the rubber manufacturing industry but this was to be expected. The percentage of reclaimed use in comparison to crude rubber was 42.3 per cent as against 47.5 in May. Reclaimers, however, have not let up in production and all report a satisfactory volume of sales. Price levels are being maintained in the face of hard competition. The latest prices are as follows:

| | | | |
|---|---|---|---|
| ***High Tensile*** | | | |
| Super-Reclaim No. 1 Black | lb. | .12½@ | .13 |
| Super-Reclaim No. 2 Black | lb. | .11½@ | .11¾ |
| High Tensile Red | lb. | .13½@ | .13¾ |
| ***Shoe*** | | | |
| Unwashed | lb. | .07¼@ | .07½ |
| Washed | lb. | .10 @ | .10¼ |
| ***Tube*** | | | |
| No. 1 (Floating) | lb. | .14½@ | .15 |
| No. 2 (Compounded) | lb. | .11 @ | .11½ |
| ***Tires*** | | | |
| Black, washed | | .09½@ | .10 |
| Black, unwashed | | .07¾@ | .08 |
| Black selected tires | lb. | .08¼@ | .08½ |
| Dark Gray | lb. | .09¾@ | .10 |
| Light Gray | lb. | .12 @ | .12½ |
| White | lb. | .13 @ | .13½ |
| Truck, Heavy Gravity | lb. | .07¼@ | .07½ |
| Truck, Light Gravity | lb. | .07¾@ | .08 |
| ***Miscellaneous*** | | | |
| Mechanical Blends | lb. | .07 @ | .08 |
| Red | lb. | .13½@ | .13¾ |

## Scrap Rubber

Prices slightly higher than those of last month are being offered collectors of scrap as an inducement to increase the present scant accumulations of scrap rubber. The demand still continues in good volume from reclaimers and prices to such consumers remain unchanged. Latest quotations follow:

(Prices to Consumer)

| | | | |
|---|---|---|---|
| Auto tire peelings | ton | 32.00 | @34.00 |
| Standard White auto | ton | 50.00 | @52.00 |
| Mixed auto | ton | 22.00 | @23.00 |
| Bicycle tires | ton | 25.00 | @27.50 |
| Clean solid truck tires | ton | 22.00 | @24.00 |
| Boots and shoes | lb. | .01¼@ | .01⅜ |
| Arctics, trimmed | lb. | .00⅞@ | .01 |
| Arctics, untrimmed | lb. | .00½@ | .00¾ |
| Inner tubes, No. 1 | lb. | .06⅝@ | .07 |
| Inner tubes, No. 2, compounded | | .04¼@ | .04½ |
| Inner tubes, Red | lb. | .05¾@ | .06 |
| Air Brake Hose | ton | 35.00 | @37.50 |
| Rubber Hose | ton | 18.00 | @20.00 |

## CRUDE RUBBER

STIMULATED by factory inquiries and actual orders in fair volume the crude rubber market has slightly improved in price levels and has averaged around 19½ cents for spot and nearby deliveries during the last two weeks. The firmness of the market has also been largely due to the statistical position of rubber which has improved from the standpoint of trading circles.

The general tone of the market has been firm with very little speculative interest in evidence and the opinion on the part of traders is that the industry can look for a steady market for the time being.

The report of the Rubber Association of America showing a record consumption during June was received with considerable enthusiasm among the trade and contributed to the firmness of the market. At the same time London and Singapore have also showed a determined steadiness, which has been all the more enhanced by the continued decline in London stocks.

Production in the manufacturing industry is reported to be keeping up at high levels.

The dark cloud which still hangs over the market in connection with the uncertainty as to the possible accumulation of stocks in the Far East as of November 1 next is serving to still keep interest away from the too distant deliveries and at the same time serves to check any bullish tendency in the market.

The daily fluctuations in the market have been between very narrow limits. With the prevailing prices for standard plantation grades the interest in Paras and off-grades remains nominal.

Prices on the New York outside market on July 19, were as follows:

| | | | |
|---|---|---|---|
| ***Plantations—*** | | | |
| Ribbed Smoked Sheets— | | | |
| Spot | | .19½@ | .19¾ |
| July | | .19½@ | .19¾ |
| Aug.-Sept. | | .19½@ | .19¾ |
| First Latex, crepe spot | | .20¼@ | .20¾ |
| Amber Crepe, No. 2 | | .19½@ | .19⅝ |
| Amber Crepe, No. 3 | | .19¼@ | .19⅜ |
| Amber Crepe, No. 4 | | .19 @ | .19⅛ |
| Brown Crepe, Rolled | | .18⅞@ | .19 |
| Brown Crepe, Clean, thin | | .19¼@ | .19⅜ |
| Brown Crepe, specky | | .19 @ | .19⅛ |
| Liquid Latex, per gal. | | @ | 1.50 |
| ***Paras—*** | | | |
| Up-river Fine | | .22¾@ | .23 |
| Up-river Medium | | Nominal | |
| Up-river Coarse | | .14½@ | .15 |
| Acre Bolivian, fine | | .22½@ | .23 |
| Caucho Ball, Upper | | .13 @ | .13½ |
| Islands, fine | | .16 @ | .16½ |
| ***Centrals—*** | | | |
| Central, scrap | | .15 @ | .15½ |
| Esmeraldas | | .15 @ | .15½ |
| Guayule, washed and dried | | — @ | .19 |
| ***Balata—*** | | | |
| Block, Colombia | | Nominal | |
| Block, Cuidad | | .38 @ | .39 |

### LONDON MARKET

Standard Ribbed Smoked Sheets—Buyers

| | | | |
|---|---|---|---|
| Spot | | 9½@ | 9⅝d |
| July | | 9½@ | 9⅝d |
| Aug.-Sept. | | 9½@ | 9⅝d |

### SINGAPORE MARKET

Standard Ribbed Smoked Sheets—Sellers

| | | | |
|---|---|---|---|
| Spot | | 9¼@ | 9¼d |

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# LATE RUBBER CHEMICAL PRICES

## Accelerators—Colors—Softeners—Compounding Materials

**NEW YORK, JULY 21, 1928**

PRICES of compounding materials remain firm and unchanged. Demand for staples continues on a large scale with accelerators and blacks maintaining their positions at the head of the list. Antioxidants are coming into more general use and many manufacturers who were slow in adopting them are now using one or more of the leading brands in their various products. Final reports on June consumption of crude rubber show that a greater tonnage was consumed than in any single month in the history of the industry. Tire factories continue their high production schedules and are expected to continue so for some time. A number of new materials are expected to be announced shortly among which will be several blacks and an anti-oxidant which is adapted for use in light-colored goods.

### ACCELERATORS

| | | | |
|---|---|---|---|
| **Organic** | | | |
| A-7 | lb. | .55 @ | .59 |
| A-11 | lb. | .62 @ | .66 |
| A-16 | lb. | .57 @ | .61 |
| A-19 | lb. | .58 @ | .62 |
| A-30 | lb. | .64 @ | .68 |
| Aero-X | lb. | .75 @ | — |
| Aldehyde ammonia, crystals | lb. | .65 @ | .70 |
| Aniline oil, drums, f.o.b. works | lb. | .15 @ | .16¼ |
| Crylene | lb. | .55 @ | .65 |
| paste | lb. | .45 @ | .55 |
| Di-Ortho-Tolylguanidine | lb. | .48 @ | .50½ |
| Diphenylguanidine | lb. | .40 @ | .42½ |
| Ethylidene aniline | lb. | .45 @ | .47½ |
| Formaldehyde Aniline, 140° m. p. | lb. | .33 @ | .35½ |
| Formaldehyde Aniline, 60° m. p. | lb. | .31 @ | .33½ |
| Grasselerator 102 | lb. | .62½@ | .67½ |
| Grasselerator 552 | lb. | 4.45 @ | 4.60 |
| Grasselerator 808 | lb. | 1.00 @ | 1.10 |
| Grasselerator 833 | lb. | 1.40 @ | 1.55 |
| Heptene | lb. | .45 @ | .55 |
| Hexamethylene-tetramine | lb. | .57½@ | .60 |
| Lithex | lb. | .18 @ | .20 |
| Methylenedianilide | lb. | .36 @ | .37 |
| Monex | lb. | 3.25 @ | — |
| Oynone | lb. | .68 @ | .80 |
| Para-Nitrosodimethylaniline, f.o.b. works | lb. | .92 @ | .96 |
| Piperidine-Piperidyldithio-Carbamate | lb. | 4.45 @ | 4.60 |
| R & H 40 | lb. | .40 @ | .42½ |
| R & H 50 | lb. | .40 @ | .42½ |
| R & H 397 | lb. | .75 @ | .77½ |
| Safex | lb. | 1.20 @ | 1.25 |
| Tensilac, No. 39 | lb. | .50 @ | .52½ |
| Tensilac, No. 41 | lb. | .50 @ | .52½ |
| Thermlo F | lb. | .50 @ | .55 |
| Thiocarbanilide, drums | lb. | .25½@ | .26½ |
| Thionex | lb. | 3.25 @ | — |
| Trimene | lb. | .75 @ | — |
| base | lb. | 1.20 @ | — |
| Triphenylguanidine | lb. | .65 @ | .70 |
| Vulcanex | lb. | .68 @ | — |
| Vulcone | lb. | .68 @ | — |
| Vulcanol | lb. | 1.03 @ | 1.08 |
| Waxene | lb. | .30 @ | .32 |
| Z 88 | lb. | .65 @ | .69 |
| **Inorganic** | | | |
| Lead, sublimed blue | lb. | .08¼@ | .08¾ |
| Lead, white | lb. | .10½@ | .12½ |
| Litharge, domestic | lb. | .09 @ | .09¼ |
| Magnesia, calcined, light | per 100 lb. | 5.35 @ | 5.45 |
| heavy | per 100 lb. | 3.65 @ | 3.75 |

### COLORS

| | | | |
|---|---|---|---|
| **Blacks (See Compounding Materials)** | | | |
| **Blues** | | | |
| Prussian | lb. | .33 @ | .35 |
| Ultramarine | lb. | .06 @ | .30 |
| **Browns** | | | |
| Sienna, Italian | lb. | .05 @ | .12½ |
| Umber, Turkey | lb. | .04½@ | .07 |
| **Greens** | | | |
| Chrome, light | lb. | .27 @ | .31 |
| medium | lb. | .29 @ | .32 |
| dark | lb. | .31 @ | .34 |
| Chromium Oxide, bbl. | lb. | .34 @ | .36 |
| **Reds** | | | |
| Antimony crimson, 15/17 | lb. | .44 @ | .50 |
| sulphur free | lb. | .50 @ | .55 |
| golden 15/17 F.S. | lb. | .18 @ | .22 |
| Indian English | lb. | .08 @ | .12 |
| Domestic (Maroon) | lb. | .08 @ | .12 |
| Oximony | lb. | .13¼@ | — |
| Red oxide, pure | lb. | .10 @ | .12 |
| Venetian red | lb. | .03 @ | .06 |
| Vermillion, quicksilver, English | lb. | 1.85 @ | 1.95 |
| **Whites** | | | |
| Lithophone, Akcolith | lb. | .05 3/5@ | .06 |
| Lithophone, Azolith | lb. | .05¼@ | .05¾ |
| Lithopone, Vanolith | lb. | .05¾@ | — |
| Titanox | lb. | .10 @ | .10½ |
| Cal. Base Pigment | lb. | .10 @ | .10½ |
| **Zinc Oxide—American Process** | | | |
| American Azo: | | | |
| ZZZ (lead free) | lb. | .06½@ | .07 |
| ZZ (leaded) | lb. | .06⅝@ | .07⅛ |
| **Zinc Oxide—French Process** | | | |
| White seal | lb. | .11⅞@ | — |
| Green seal | lb. | .10⅞@ | — |
| Red Seal | | .09⅞@ | — |
| **Yellows** | | | |
| Chrome | lb. | .15½@ | .16½ |
| Ocher, French medium | lb. | .03½@ | .06 |
| domestic | lb. | .01⅝@ | .02 |

### COMPOUNDING MATERIALS

| | | | |
|---|---|---|---|
| Aluminum Flake | ton | 21.85 @ | 24.50 |
| Ammonia carbonate | lb. | .10½@ | .12 |
| Asbestine | ton | 14.75 @ | 18.00 |
| Barium carbonate | lb. | .03½@ | .05 |
| Barium Dust | lb. | .05 @ | .06 |
| Barytes southern off-color, | ton | 12.00 @ | 18.00 |
| Western prime white | ton | 28.00 @ | — |
| imported | ton | 27.00 @ | 36.00 |
| Basofor | lb. | .04½@ | — |
| **Blacks** | | | |
| Arrow "Aerfloted" | lb. | .08 @ | .12 |
| Bone Black | lb. | .05½@ | .11 |
| Carbon, compressed | lb. | .07½@ | .11½ |
| Carbon, uncompressed | lb. | .07 @ | .11 |
| Drop Black | lb. | .06 @ | .10 |
| Gastex | lb. | .05¼@ | .05½ |
| Lamp Black | lb. | .12 @ | .40 |
| Micronex | lb. | .08 @ | .12 |
| Velvetex carbon | lb. | .04 @ | .07 |
| Blanc fixe dry f.o.b. works | lb. | .03½@ | .03⅝ |
| Carrara filler | lb. | .01¾@ | .02 |
| Catalpo (fact.) | lb. | .02 @ | — |
| Chalk | ton | 12.00 @ | 14.00 |
| Clay, China, domestic | ton | 8.00 @ | 9.00 |
| Aerfloted Suprex | ton | 9.00 @ | 20.00 |
| Congaree, c. l. f.o.b. mine | ton | 9.00 @ | — |
| Mineral Flour, c. l. fob mine | ton | 20.00 @ | 23.00 |
| Tensulite | | 15.00 @ | — |
| Glues, extra white | lb. | .22 @ | .26 |
| medium white | lb. | .20 @ | .24 |
| Magnesia, carbonate | lb. | .08½@ | .11 |
| Mica, powdered | ton | 65.00 @ | 80.00 |
| Rotten Stone (powdered) | lb. | .02½@ | .04½ |
| Soapstone, powdered | ton | 15.00 @ | 22.00 |
| Starch, powdered | cwt. | 3.30 @ | 3.70 |
| Talc, domestic | ton | 12.00 @ | 15.00 |
| Velvetex | lb. | .04 @ | .07 |
| Whiting, commercial | cwt. | .85 @ | 1.00 |
| English cliffstone | cwt. | 1.50 @ | — |
| Superfine | ton | 10.00 @ | 12.00 |
| Witco | ton | 12.00 @ | — |
| Wood pulp XXX | ton | 45.00 @ | — |
| Wood pulp X | ton | 25.00 @ | — |
| Zinc Carbonate | lb. | .09½@ | .10½ |
| Zinc Stearate | lb. | .18½@ | .19½ |

### MINERAL RUBBER

| | | | |
|---|---|---|---|
| Genasco (factory) | ton | 50.00 @ | 52.00 |
| Montezuma, solid | ton | 28.00 @ | 36.00 |
| Montezuma, granulated | ton | 32.00 @ | 42.00 |
| Paradura | ton | 62.50 @ | 65.00 |
| Pioneer, MR, solid | ton | 42.00 @ | 45.00 |
| Pioneer-granulated | ton | 52.00 @ | 55.00 |
| Robertson, MR, solid | ton | 34.00 @ | 80.00 |
| M.R. (gran) | ton | 38.00 @ | 80.00 |

### SOFTENERS

| | | | |
|---|---|---|---|
| **Acids** | | | |
| Nitric, 36 degrees | cwt. | 5.00 @ | 5.25 |
| Sulphuric, 60 degrees | ton | 10.50 @ | 11.50 |
| 66 degrees | ton | 15.00 @ | 16.00 |
| Tartaric, crystals | lb. | .35 @ | .36 |
| **Acids, Fatty** | | | |
| Stearex | lb. | .10 @ | .14 |
| Stearic, double pressed | lb. | .11½@ | .12½ |
| **Alkalies** | | | |
| Caustic soda, 76% | cwt. | 3.76 @ | 3.91 |
| Soda ash, 58% C.L. | cwt. | 1.40 @ | |
| **Oils** | | | |
| Corn, refined, bbls. | lb. | .11 @ | .11½ |
| Cottonseed, crude | | .08½@ | .08¾ |
| Cycline | gal. | .27 @ | .34 |
| Degras (c.l. 100 bbls.) | lb. | .03¾@ | — |
| Less c. l. (10-25 bbls.) | lb. | .04 @ | — |
| Lots less than 10 bbls. | lb. | .04¼@ | .04½ |
| Fluxrite | lb. | .05 @ | .06 |
| Hexalin | lb. | .60 @ | — |
| Acetate | lb. | .70 @ | — |
| Linseed, Raw C.L. bbl. | lb. | .09½@ | .10 |
| Palm Lagos | lb. | .07¼@ | .07½ |
| Niger | lb. | .07¾@ | .08 |
| Vansulol | lb. | .10½@ | — |
| Para-Flux | gal. | .17 @ | — |
| Peanut, domestic, crude | lb. | .12 @ | .12¼ |
| Petrolatum, white | lb. | .08 @ | .08½ |
| dark amber | lb. | .03⅝@ | .03⅝ |
| Pine, steam distilled | lb. | .70 @ | |
| Rapeseed, refined | gal. | 1.04 @ | 1.06 |
| second rectified | gal. | .58 @ | — |
| **Resins and Pitches** | | | |
| Pitch, Burgundy | lb. | .06½@ | .07½ |
| coal tar | gal. | .05½@ | .06 |
| pine, 200 lb. gr. wt. | bbl. | 9.00 @ | 10.00 |
| Rosin, grade K, 280 lb. bbl. | | 8.55 @ | — |
| Pigmentar | gal. | .33 @ | .41 |
| Tar Retort, 50 gal. | bbl. | 12.50 @ | 13.00 |
| **Solvents** | | | |
| Acetone, pure | lb. | .13 @ | |
| Alcohol denatured, No. 1 bbls. | gal. | .37½@ | .44½ |
| Benzol, 90% | gal. | .28 @ | — |
| Carbon bisulphide | lb. | .05½@ | .06¼ |
| Carbon tetrachloride | lb. | .06¼@ | .07 |
| Motor gasoline, steel bbls. | gal. | .17 @ | — |
| Naptha, solvent | gal. | .35 @ | .40 |
| Turpentine, spirits | gal. | .60 @ | .64 |
| wood | gal. | .50 @ | .54 |
| **Waxes** | | | |
| Beeswax | lb. | .56 @ | .58 |
| Carnauba | lb. | @ | .50 |
| Ceresin, white | lb. | .10 @ | .11 |
| Montan, crude | lb. | .07 @ | .07½ |
| Ozokerite, black | lb. | .24 @ | .25 |
| green | lb. | .26 @ | .30 |
| **Miscellaneous** | | | |
| RSL Mold Solution | gal. | .75 @ | .100 |

### ANTI-OXIDANTS

| | | | |
|---|---|---|---|
| Antox | lb. | .79 @ | .83 |
| Neozone | lb. | .74 @ | — |
| Oxynone | lb. | .68 @ | .80 |
| Resistox | lb. | .54 @ | .57 |
| Stabilite | lb. | .65 @ | — |
| VGB | lb. | .55 @ | .66 |

### SUBSTITUTES

| | | | |
|---|---|---|---|
| Black | lb. | .08 @ | .14 |
| White | lb. | .10 @ | .16 |
| Brown | lb. | .08 @ | .15 |

### VULCANIZING INGREDIENTS

| | | | |
|---|---|---|---|
| Sulphur Chloride (drums) | lb. | .03¼@ | .03½ |
| Sulphur flour, Superfine bags | cwt. | 2.20 @ | 2.80 |
| Superfine, bbls. | cwt. | 2.55 @ | 3.10 |
| 100% pure, refined, bags | cwt. | 2.60 @ | 3.15 |
| bbls. | cwt. | 2.95 @ | 3.50 |

TIRES & TUBES
CRUDE RUBBER

# STATISTICAL SECTION

AUTOMOBILES
GASOLINE

RUBBER statistics are beginning to assume an interesting angle. The figure representing the consumption of crude rubber in the United States during June is the highest in the history of the manufacturing industry and reflects the heavy production schedules which the factories are now carrying. The May output of tires and tubes also established a record.

At the same time rubber imports fell off considerably and stocks declined. The last week marks the fourteenth consecutive week that London stocks have shown a continuous falling off. The heavy consumption in the United States during the last two months and the drop in imports have likewise brought about a reduction in domestic stocks.

**PLAN OF THE SECTION**

**The statistics included in this section have been chosen for their constant importance to the rubber industry. The tables are reprinted in the same relative position in every issue, each table being kept current by the addition of new figures as soon as they become available. The section accordingly affords the most up-to-date, complete and convenient statistical service in the industry.**

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This change in the situation and drop in visible stocks has had very little effect, however, on the market and prices have remained fairly steady, only advancing slightly and evenly on the strength of fair buying interest. The market seems settled for some time to come around 19½ cents.

Stocks in Singapore showed an advance of a few tons at the end of June. This may or may not represent the first of the expected accumulations of rubber which are the cause of worry to all in rubber trading circles, but this figure will warrant careful watching until next November.

Latest figures covering imports and exports from the leading consuming and producing markets have been added to the appropriate tables in this section.

## U. S. Imports and Exports of Crude Rubber

| | Gross Imports | | | Re-exports | | | Net Imports |
|---|---|---|---|---|---|---|---|
| YEARS | Long Tons | Total Declared Value | Average Declared Value per pound Cents | Long Tons | Total Declared Value | Average Declared Value per pound Cents | Long Tons |
| 1921 | 185,394 | 73,772,677 | 17.76 | 5,716 | 2,414,924 | 18.86 | 179,678 |
| 1922 | 301,076 | 101,843,188 | 15.10 | 4,809 | 1,921,828 | 17.84 | 296,267 |
| 1923 | 309,144 | 185,060,304 | 26.72 | 8,772 | 5,672,319 | 28.37 | 300,372 |
| 1924 | 328,056 | 174,231,331 | 23.71 | 10,309 | 6,057,637 | 26.23 | 317,747 |
| 1925 | 396,642 | 429,705,014 | 48.36 | 14,827 | 19,847,753 | 59.76 | 381,815 |
| 1926 | 413,338 | 505,817,807 | 54.63 | 17,671 | 22,470,583 | 56.77 | 395,667 |
| 1927 | 426,258 | 339,874,774 | 35.60 | 27,775 | 24,735,488 | 39.76 | 398,483 |
| 1926: | | | | | | | |
| Jan. | 42,404 | 72,528,151 | 76.36 | 2,059 | 3,747,505 | 81.24 | 40,345 |
| Feb. | 32,865 | 58,733,370 | 79.78 | 1,430 | 2,280,168 | 71.17 | 31,435 |
| Mar. | 42,152 | 70,589,581 | 74.76 | 1,836 | 2,735,234 | 66.51 | 40,316 |
| Apr. | 34,544 | 48,742,539 | 62.99 | 1,128 | 1,605,093 | 63.58 | 33,416 |
| May | 29,756 | 36,896,080 | 55.35 | 1,052 | 1,558,987 | 66.17 | 28,704 |
| June | 24,900 | 34,498,561 | 61.85 | 1,105 | 1,371,217 | 55.41 | 23,795 |
| July | 35,820 | 33,061,281 | 41.20 | 1,554 | 1,743,854 | 50.09 | 34,266 |
| Aug. | 27,400 | 24,670,752 | 40.21 | 1,318 | 1,339,563 | 45.38 | 26,082 |
| Sept. | 37,112 | 32,625,032 | 39.25 | 1,437 | 1,519,870 | 47.20 | 35,675 |
| Oct. | 29,746 | 25,320,558 | 38.49 | 1,366 | 1,316,270 | 43.03 | 28,110 |
| Nov. | 39,155 | 34,890,536 | 39.78 | 1,482 | 1,411,517 | 42.51 | 37,673 |
| Dec. | 37,754 | 33,261,366 | 39.33 | 1,904 | 1,841,305 | 48.16 | 35,850 |
| 1927: | | | | | | | |
| Jan. | 43,340 | 36,753,719 | 37.86 | 1,525 | 1,444,734 | 42.28 | 41,815 |
| Feb. | 28,337 | 23,110,257 | 36.41 | 2,451 | 2,277,297 | 41.47 | 25,886 |
| Mar. | 35,515 | 28,693,016 | 36.07 | 2,763 | 3,249,665 | 52.50 | 32,752 |
| Apr. | 46,202 | 37,321,505 | 36.06 | 1,575 | 1,428,425 | 40.48 | 44,627 |
| May | 36,518 | 30,984,377 | 37.88 | 2,782 | 2,501,562 | 40.14 | 33,736 |
| June | 33,045 | 27,850,014 | 37.62 | 1,775 | 1,550,592 | 39.00 | 31,270 |
| July | 37,677 | 31,678,259 | 37.53 | 1,958 | 1,560,853 | 35.59 | 35,719 |
| Aug. | 32,810 | 26,396,931 | 35.92 | 1,809 | 1,382,768 | 34.12 | 31,001 |
| Sept. | 33,301 | 25,314,412 | 33.94 | 3,500 | 3,036,929 | 38.74 | 29,801 |
| Oct. | 30,184 | 22,163,282 | 32.78 | 2,513 | 2,042,713 | 36.29 | 27,671 |
| Nov. | 38,592 | 27,395,428 | 31.69 | 2,469 | 2,014,196 | 36.43 | 36,123 |
| Dec. | 30,737 | 22,213,574 | 32.26 | 2,655 | 2,245,754 | 37.77 | 28,082 |
| 1928: | | | | | | | |
| Jan. | 39,108 | 30,278,444 | 34.56 | 1,988 | 1,734,990 | 38.95 | 37,120 |
| Feb. | 33,664 | 27,763,655 | 36.82 | 2,738 | 2,229,589 | 36.35 | 30,926 |
| Mar. | 40,688 | 32,109,376 | 35.23 | 3,718 | 2,587,434 | 31.07 | 36,950 |
| Apr. | 37,958 | 27,296,346 | 32.23 | 2,272 | 1,415,024 | 27.80 | 35,686 |
| May | 31,058 | 19,058,672 | 27.80 | 2,399 | 1,386,307 | 25.80 | 28,659 |
| June | 27,764 | 14,121,219 | 22.71 | | | | |
| July | | | | | | | |
| Aug. | | | | | | | |
| Sept. | | | | | | | |
| Oct. | | | | | | | |
| Nov. | | | | | | | |
| Dec. | | | | | | | |

## U. S. Consumption of Crude Rubber

*(Rubber Association of America statistics raised to 100 per cent—All figures in long tons)*

**Figures on Monthly Basis**

| | 1921 | 1922 | 1923 | 1924 | 1925 | 1926 | 1927 | 1928 |
|---|---|---|---|---|---|---|---|---|
| Jan. | 5,045 | 16,938 | 30,106 | 29,058 | 29,638 | 32,196 | 31,518 | 34,403 |
| Feb. | 5,955 | 14,767 | 30,149 | 25,736 | 29,761 | 31,136 | 30,137 | 33,702 |
| Mar. | 9,190 | 21,408 | 36,629 | 28,385 | 33,498 | 32,936 | 36,141 | 35,688 |
| Apr. | 13,084 | 19,294 | 29,085 | 27,129 | 34,139 | 32,696 | 35,871 | 32,772 |
| May | 16,023 | 23,246 | 36,155 | 25,845 | 35,322 | 29,364 | 34,592 | 37,333 |
| June | 16,142 | 31,713 | 24,272 | 22,753 | 35,822 | 28,598 | 33,801 | 37,676 |
| July | 18,310 | 24,522 | 17,685 | 23,396 | 36,053 | 27,577 | 29,219 | |
| Aug. | 23,649 | 29,361 | 20,359 | 28,982 | 35,909 | 34,533 | 33,460 | |
| Sept. | 16,705 | 24,410 | 17,594 | 31,497 | 31,691 | 32,904 | 27,214 | |
| Oct. | 16,814 | 26,881 | 21,321 | 31,520 | 29,047 | 29,836 | 26,790 | |
| Nov. | 14,105 | 24,950 | 20,437 | 27,289 | 28,853 | 28,080 | 26,792 | |
| Dec. | 15,482 | 25,070 | 21,902 | 27,199 | 28,748 | 26,293 | 25,492 | |
| Totals | 170,504 | 282,560 | 305,694 | 328,769 | 388,481 | 366,149 | 371,027 | |

**Figures on Quarterly Basis**

| Quarter | 1921 | 1922 | 1923 | 1924 | 1925 | 1926 | 1927 | 1928 |
|---|---|---|---|---|---|---|---|---|
| Jan./Mar. | | | 96,776 | 87,609 | 95,263 | 94,301 | 99,216 | 103,558 |
| Apr./June | 65,463 | 127,360 | 89,493 | 75,674 | 104,099 | 87,109 | 103,242 | |
| July/Sept. | | | 55,621 | 83,813 | 99,493 | 93,798 | 89,210 | |
| Oct./Dec. | 105,962 | 155,067 | 63,617 | 92,656 | 85,789 | 83,212 | 80,860 | |
| Totals | 171,425 | 282,427 | 305,507 | 339,752 | 384,644 | 358,415 | 372,528 | 103,558 |

**Note—The Rubber Association estimates its monthly rubber consumption figures to be 90 per cent complete. Up until 1925 the quarterly figures were likewise estimated to be 90 per cent complete; beginning with 1925 an estimate of 92 per cent completeness has been used. These estimates have been used in raising the figures in this table to 100 per cent. The quarterly figures are generally regarded as the most authentic; the monthly figures may be accepted as preliminary.**

## Rubber Invoiced to the U. S.

*(Reported by American Consuls—Quantities in Long Tons)*

| During the Week Ended | From Br. Malaya | From Ceylon | From Dutch East Indies | From London & Liverpool | Total |
|---|---|---|---|---|---|
| May 12 | 2,797 | 331 | 1,374 | 785 | 5,287 |
| May 19 | 3,210 | 429 | 1,334 | 723 | 5,696 |
| May 26 | 4,404 | 435 | 1,409 | 2,921 | 9,169 |
| June 2 | 3,799 | 1,020 | 1,306 | 1,094 | 7,219 |
| June 9 | 4,629 | 209 | 1,373 | 490 | 6,701 |
| June 16 | 3,335 | 326 | 1,652 | 1,020 | 6,333 |
| June 23 | 3,787 | 266 | 1,708 | 2,270 | 8,031 |
| June 30 | 4,797 | 1,094 | 1,670 | 821 | 8,382 |
| July 7 | 5,231 | 899 | 1,601 | 842 | 8,753 |
| July 14 | 4,403 | 859 | 2,249 | 277 | 7,788 |

## Daily Spot Closing Prices of Ribbed Smoked Sheet Rubber—*New York Market, in Cents per Pound*

| | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 13 | 14 | 15 | 16 | 17 | 18 | 19 | 20 | 21 | 22 | 23 | 24 | 25 | 26 | 27 | 28 | 29 | 30 | 31 | Ave. |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **1925** | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| October | 91¼ | 91¼ | 92 | — | 94½ | 97 | 97½ | 99 | 99¾ | 101 | — | — | 97¾ | 95½ | — | 97 | 99 | 99 | 99 | 101¼ | 102 | 99¼ | 99¼ | 99¼ | — | — | 99½ | 101½ | 99¾ | 100¼ | 98 |
| November | — | 99¼ | — | 98⅜ | 98⅜ | 100 | 100¾ | — | 98¾ | 99½ | 100¾ | 101¾ | 104½ | 105½ | — | 101 | — | 107 | 109⅜ | 110⅜ | 110½ | — | 110½ | 109 | 106¼ | — | — | 105¾ | 108⅜ | — | 107 | 104⅜ |
| December | 106⅜ | 108½ | 107⅜ | 107¼ | 108¼ | — | 108 | 109 | 109¾ | 106 | 105½ | 105½ | — | — | — | — | 99¼ | 90¼ | 86¾ | — | 88¼ | 90¼ | 88¾ | 88¾ | — | — | — | 105¾ | 108⅜ | 91 | 93 | 98½ |
| **1926** | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| January | — | — | — | 87 | 87¼ | 85½ | 86½ | 87½ | — | 88¼ | 88¼ | 88¼ | 88¼ | 85½ | 84½ | 82½ | — | 75½ | 75½ | 75½ | 75 | 72 | 72½ | 68 | 66½ | 67 | 67 | 69¼ | 70½ | 69 | — | 79½ |
| February | 67 | 67½ | 66¼ | 66⅜ | 68 | 67½ | — | 66 | 65 | 66 | 66 | 63 | 65½ | — | — | 63 | 60½ | 60 | 59 | 60 | — | 56 | 55 | 52 | 51¾ | 51 | 51 | — | — | — | — | 62¾ |
| March | 55 | 58 | 53 | 53⅜ | 53⅜ | — | — | 56 | 55½ | 61 | 60 | 63 | 61½ | — | — | 62 | 60½ | 62 | 61 | 61½ | — | 61 | 61 | 60 | 59½ | 60 | 59 | 59½ | 58½ | 58 | — | 59 |
| April | 59 | — | — | 59 | 59 | 58 | 56½ | 56½ | 53 | 53 | 53 | 51½ | 50½ | 49¼ | 47½ | 47½ | 47½ | 47½ | 47½ | 45½ | 47½ | 48 | 48 | 48½ | 46 | 48 | 48 | 48 | 48½ | — | — | 51¼ |
| May | 48½ | — | — | 50 | 50¼ | 49½ | 49¾ | 49½ | — | 49 | 49½ | — | 48½ | 47¾ | 47½ | 48½ | — | 47½ | 47½ | 48 | — | 44 | 46¾ | — | 45 | 46 | 46 | 46 | 46 | — | — | 47¾ |
| June | 41½ | — | 41½ | 42 | 41½ | 41½ | 41½ | 42 | 43 | 43 | 42 | 41½ | 41½ | 42 | 40 | 43 | 43 | 43 | 43 | 43 | 41½ | 44 | 43½ | 43½ | 43 | 45 | 42 | 41½ | 42 | 42 | 39 | 42½ |
| July | 42 | — | 42 | 42 | 42 | 41½ | — | 41½ | — | 40 | 40 | 41½ | 41½ | 41 | 40 | 40 | 40 | 40 | 40 | 40 | 41½ | 41 | 41 | 41½ | 41½ | 39 | 39 | 39 | 42 | 41 | 39 | 41¼ |
| August | — | 38½ | 38½ | 38¾ | 39 | 39 | 40¼ | 40¾ | 40¾ | 40¾ | 40¾ | 40¾ | 40¾ | 41 | 41 | 40¾ | 40¾ | 40¾ | 40¾ | 40¾ | 41 | 39¾ | 42 | 42¾ | 42½ | 42¾ | 42½ | 42½ | 42½ | 42½ | 39½ | 38½ |
| September | 40¼ | 40¼ | 40¼ | 40¼ | 40¼ | 40¼ | 40¼ | 40¼ | 40¾ | 40¾ | 40¾ | 40¾ | 40¾ | 40¾ | 40¾ | 43¼ | 43¼ | 43¼ | 40½ | 42½ | 42¼ | 41 | 42¼ | 42½ | 42½ | 42½ | 42½ | 42½ | 42½ | 42½ | 40 | 41 |
| October | 43 | 43 | — | — | 42¾ | 42¾ | 42½ | — | 42¾ | 42½ | 42½ | 42½ | 42½ | 42½ | 42½ | 43 | 43 | 43 | 42½ | 42½ | 42¾ | 42½ | 42½ | 42½ | 42½ | 42½ | 42½ | 42½ | 42½ | — | — | 42½ |
| November | 41¼ | 41¼ | 41 | 41¼ | 41¼ | 41½ | 41½ | 41½ | 41¾ | 41¾ | 41¾ | 41¾ | 41¾ | 41¼ | 41¼ | 41¼ | 41¼ | 41¼ | 41¼ | 41¼ | 41½ | 41¼ | 41¼ | 41¼ | 41¼ | 41¼ | 41¼ | 41¼ | 41¼ | 41¼ | — | 41¼ |
| December | 36¾ | 37½ | 37½ | 37½ | 37½ | — | 37 | 37⅝ | 37 | 37 | 37½ | — | 37½ | 37¾ | 37¾ | 38 | 38 | 38 | 38 | 39 | 38 | 38¼ | 38½ | 38 | — | — | 37¾ | 37 | 38¼ | 38½ | 38¼ | 38¼ |
| **1927** | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| January | — | 38½ | — | 39 | 39¾ | 40¾ | 40¾ | 40¾ | — | 40½ | 40¾ | 40¾ | 40¾ | 40 | 39¾ | 39¾ | 39¼ | 38¾ | 38½ | 38¾ | 38¼ | 38¾ | 38¼ | — | 38¼ | 38 | 38½ | 38½ | 38⅝ | 38 | 38 | 38¾ |
| February | 37⅞ | 37⅞ | 37½ | 37½ | 37½ | — | — | 37⅞ | — | 38 | 37¾ | 37¾ | — | — | 38¼ | 38⅛ | 38¼ | 38¾ | 38¾ | 38¾ | 38½ | — | 39 | 39 | 39 | 39 | 39 | 39½ | 39½ | — | — | 38¾ |
| March | 39¾ | 39¾ | 40 | 40¾ | 41 | — | — | 40¾ | 40¾ | 40¾ | 41¾ | 41¾ | 41¾ | 41¾ | 41¾ | 41¾ | 41¼ | 41¼ | 41½ | 41¾ | 41¾ | 41¾ | 41¾ | 41¾ | 41¾ | 41¾ | 41 | 41 | 41 | 41 | 41 | 41 |
| April | 41¼ | 41¼ | 41 | 41 | 41 | 41¼ | 41¼ | 41¼ | — | 41¼ | 41¼ | 41¼ | 41¼ | 41 | 41 | 40¾ | — | 40¾ | 40½ | 40¾ | 40¾ | 40¾ | 40¾ | 40¾ | 40¾ | 40¾ | 40¾ | 40½ | 41¼ | 41¼ | 41¼ | 40⅞ |
| May | — | 40½ | 40¾ | 40½ | 40¾ | 40¾ | 40¾ | 40¾ | — | 40¾ | 40¾ | 40¾ | 40¾ | 40¾ | 40¾ | — | 40¾ | 40¾ | 40¾ | 40¾ | 40¾ | 40¾ | 40¾ | 40¾ | 40¾ | 40¾ | 40¾ | 40¾ | 40½ | — | 40¾ | 40¾ |
| June | 40¾ | 40¾ | 40½ | 40½ | 40½ | — | 40¾ | 40¾ | — | 40¾ | 40¾ | 40¾ | 40¾ | 40¾ | 40¾ | 40¾ | 40¾ | 40¾ | 40¾ | 40¾ | 40¾ | 40¾ | 40¾ | 40¾ | 40¾ | 40¾ | 40¾ | 40¾ | 40¾ | 40¾ | 40¾ | 40¾ |
| July | 85½ | 85½ | — | 85½ | 85½ | — | 85½ | 85½ | — | 85½ | 85½ | 85½ | 85½ | 85½ | 85½ | 85½ | 85½ | 85½ | 85½ | 85½ | 85½ | 85½ | 85½ | 85½ | 85½ | 85½ | 85½ | 85½ | 85½ | 85½ | 85½ | 87¼ |
| August | 85½ | 85½ | 85¼ | 85¾ | 85½ | 85¾ | 85¾ | 85¾ | — | 85¾ | 85¾ | 85¾ | 85¾ | 85¾ | 85¾ | 85¾ | 85¾ | 85¾ | 85¾ | 85¾ | 85¾ | 85¾ | 85¾ | 85¾ | 85¾ | 85¾ | 85¾ | 85¾ | 85¾ | 85¾ | 85 | 85 |
| Sept. | 84 | 83¾ | — | 83¾ | 83¾ | 83¾ | 83¾ | 83¾ | — | 83¾ | 83¾ | 83¾ | 83¾ | 83¾ | 83¾ | 83¾ | 83¾ | 83¾ | 83¾ | 83¾ | 83¾ | 83¾ | 83¾ | 83¾ | 83¾ | 83¾ | 83¾ | 83¾ | 83¾ | 83¾ | 83¾ | 83¾ |
| Oct. | 83⅝ | — | 83¾ | 83¾ | 83¾ | 83¾ | 83¾ | 83¾ | — | 83¾ | 83¾ | 83¾ | 83¾ | 83¾ | 83¾ | 83¾ | 83¾ | 83¾ | 83¾ | 83¾ | 83¾ | 83¾ | 83¾ | 83¾ | 83¾ | 83¾ | 83¾ | 83¾ | 83¾ | 83¾ | 83¾ | 83¾ |
| Nov. | 85 | 85½ | 85½ | 85½ | 86¾ | 86¾ | 86¾ | 86¾ | — | 86¾ | 86¾ | 86¾ | 86¾ | 86¾ | 86¾ | 86¾ | 86¾ | 86¾ | 86¾ | 86¾ | 86¾ | 86¾ | 86¾ | 86¾ | 86¾ | 86¾ | 86¾ | 86¾ | 86¾ | 86¾ | 85¼ | 85¼ |
| Dec. | 40½ | 40¼ | 40½ | — | 40¾ | — | 40½ | 40½ | — | 40½ | 40½ | 40½ | 40½ | 40½ | 40½ | 40½ | 40½ | 40½ | 40½ | 40½ | 40½ | 40½ | 40½ | 40½ | 40½ | 40½ | 40½ | 40½ | 40½ | 40 | 40 | 87½ |
| **1928** | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| January | — | 87½ | — | 41¾ | 41¾ | 41¼ | 41 | 41 | 86¾ | 34½ | 33¾ | 33¾ | 33¾ | 33¾ | 33¾ | 33¾ | 33¾ | 33¾ | 33¾ | 33¾ | 33¾ | 33¾ | 33¾ | 33¾ | 33¾ | 33¾ | 33¾ | 33¾ | 33¾ | 33¾ | 33¾ | 40½ |
| February | 87⅜ | 87⅜ | 87½ | 87½ | 87½ | — | — | 87⅜ | — | 87⅜ | 87⅜ | 87⅜ | 87⅜ | 87⅜ | 87⅜ | 87⅜ | 87⅜ | 87⅜ | 87⅜ | 87⅜ | 87⅜ | 87⅜ | 87⅜ | 87⅜ | 87⅜ | 87⅜ | 87⅜ | 87⅜ | 87⅜ | 87⅜ | 87⅜ | 87⅜ |
| March | 28¾ | 28¾ | 27½ | — | 21¼ | 19¼ | 19¼ | 18¾ | — | 18¾ | 18¾ | 18¾ | 18¾ | 18¾ | 18¾ | 18¾ | 18¾ | 18¾ | 18¾ | 18¾ | 18¾ | 18¾ | 18¾ | 18¾ | 18¾ | 18¾ | 18¾ | 18¾ | 18¾ | 18¾ | 18¾ | 18¾ |
| April | 27¼ | 27¼ | 27½ | 27¼ | 27¼ | 27¼ | 27¼ | 27¼ | — | 27¼ | 27¼ | 27¼ | 27¼ | 27¼ | 27¼ | 27¼ | 27¼ | 27¼ | 27¼ | 27¼ | 27¼ | 27¼ | 27¼ | 27¼ | 27¼ | 27¼ | 27¼ | 27¼ | 27¼ | 27¼ | 27¼ | 27¼ |
| May | 17½ | 17¾ | 18¼ | 19¼ | 19¼ | 19¼ | 19¼ | 19¼ | — | 19¼ | 19¼ | 19¼ | 19¼ | 19¼ | 19¼ | 19¼ | 19¼ | 19¼ | 19¼ | 19¼ | 19¼ | 19¼ | 19¼ | 19¼ | 19¼ | 19¼ | 19¼ | 19¼ | 19¼ | 19¼ | 19¼ | 19¼ |
| June | 19¾ | 19¾ | — | 19¾ | 19¾ | 19¾ | 19¾ | 19¾ | — | 19¾ | 19¾ | 19¾ | 19¾ | 19¾ | 19¾ | 19¾ | 19¾ | 19¾ | 19¾ | 19¾ | 19¾ | 19¾ | 19¾ | 19¾ | 19¾ | 19¾ | 19¾ | 19¾ | 19¾ | 19¾ | 19¾ | 19¾ |
| July | — | 18⅞ | — | — | 19 | 19 | 19 | 19 | — | 19½ | 19½ | 19½ | 19½ | 19½ | 19½ | 19½ | 19½ | 19½ | 19½ | 19½ | 19½ | 19½ | 19½ | 19½ | 19½ | 19½ | 19½ | 19½ | 19½ | 19½ | 19½ | 19½ |

# Average Spot Closing Prices—Ribbed Smoked Sheets

*(New York Market)*

### Average Price per Pound for Years 1910-1921

| Year | Cents | Year | Cents | Year | Cents |
|---|---|---|---|---|---|
| 1910 | 206.60 | 1914 | 65.33 | 1918 | 60.15 |
| 1911 | 141.30 | 1915 | 65.85 | 1919 | 48.70 |
| 1912 | 121.60 | 1916 | 72.50 | 1920 | 36.30 |
| 1913 | 82.04 | 1917 | 72.23 | 1921 | 16.36 |

### Average Monthly Price per Pound Since 1922

| Months | 1922 Cents | 1923 Cents | 1924 Cents | 1925 Cents | 1926 Cents | 1927 Cents | 1928 Cents |
|---|---|---|---|---|---|---|---|
| Jan. | 18.82 | 32.73 | 25.86 | 36.71 | 79.50 | 38.75 | 40.25 |
| Feb. | 16.12 | 35.14 | 25.29 | 36.01 | 62.25 | 38.25 | 32.75 |
| Mar. | 14.53 | 34.21 | 22.83 | 41.00 | 59.00 | 41.04 | 26.82 |
| Apr. | 15.99 | 32.48 | 22.51 | 43.64 | 51.25 | 40.86 | 18.97 |
| May | 15.25 | 27.39 | 18.89 | 58.47 | 47.75 | 40.76 | 18.99 |
| June | 15.11 | 26.88 | 18.81 | 77.26 | 42.50 | 37.25 | 19.59 |
| **July** | **14.67** | **26.10** | **22.16** | **103.16** | **41.03** | **34.44** | |
| **Aug.** | **13.93** | **28.84** | **26.17** | **82.99** | **38.50** | **35.12** | |
| Sept. | 14.44 | 28.95 | 27.56 | 88.88 | 41.00 | 33.67 | |
| Oct. | 19.78 | 26.93 | 31.13 | 98.01 | 42.50 | 34.32 | |
| Nov. | 23.88 | 27.14 | 34.33 | 104.80 | 38.50 | 37.58 | |
| Dec. | 27.42 | 26.60 | 37.88 | 98.51 | 38.25 | 40.63 | |
| Average for Year | 17.50 | 29.45 | 26.20 | 72.46 | 48.50 | 37.72 | |

# London Closing Prices of Ribbed Smoked Sheet

*(In Pence Per Pound)*

### Sixth Restriction Year—Third Quarter

| Day | May | June | July | Day | May | June | July |
|---|---|---|---|---|---|---|---|
| 1 | 8¼ | 9⅜ | — | 17 | 8⅝ | — | 9½ |
| 2 | 8⅜ | 9⅜ | 9½ | 18 | 8⅝ | 9¼ | 9½ |
| 3 | 8⅝ | — | 9⅛ | 19 | 8⅝ | 9⅜ | 9½ |
| 4 | 8⅜ | 9½ | 9⅛ | 20 | — | 9½ | 9½ |
| 5 | 8¾ | 9⅛ | 9⅛ | 21 | 8¾ | 9½ | |
| 6 | — | 9¼ | 9⅜ | 22 | 8¾ | 9⅜ | |
| 7 | 8¾ | 9⅜ | 9⅜ | 23 | 8⅞ | 9⅜ | |
| 8 | 8¾ | 9⅛ | — | 24 | 9⅛ | — | |
| 9 | 9⅛ | 9¼ | 9½ | 25 | 9⅛ | 9⅜ | |
| 19 | 8¾ | — | — | 26 | — | 9⅜ | |
| 11 | 8⅞ | 9⅛ | 9⅜ | 27 | — | 9⅜ | |
| 12 | 8⅞ | 9¼ | 9⅜ | 28 | — | 9⅜ | |
| 13 | — | 9¼ | 9½ | 29 | 9½ | 9¼ | |
| 14 | 8¾ | 9⅜ | 9½ | 30 | 9½ | 9⅛ | |
| 15 | 8⅛ | 9⅜ | — | 31 | 9½ | — | |
| 16 | 8¾ | 9⅜ | 9⅜ | | | | |

**(The average price for the period for which daily prices are reported above is approximately 9.295 pence. The British Colonial Secretary has announced that only 60% of the standard production will be exportable from the restricted area during the next quarter if the price during the entire current quarter does not average at least 21 pence.)**

### Average Price in Previous Quarters

| Quarter | 1922-23 | 1923-24 | 1924-25 | 1925-26 | 1926-27 | 1927-28 |
|---|---|---|---|---|---|---|
| Nov.-Jan. | 14.285 | 14.175 | 17.9983 | 46.709 | 19.265 | 19.023 |
| Feb.-Apr. | 16.858 | 12.917 | 19.356 | 28.103 | 19.696 | 12.591 |
| May-July | 14.242 | 10.947 | 38.469 | 21.001 | 18.165 | |
| Aug.-Oct. | 14.944 | 14.632 | 43.269 | 20.199 | 16.620 | |

# Spot Closing Cotton Prices

*(Middling Upland Grade—New York Market)*

### Recent Daily Price Per Pound

| Day of Month | June | July | Day of Month | June | July | Day of Month | June | July |
|---|---|---|---|---|---|---|---|---|
| 1 | 21.05 | —— | 11 | 20.95 | 22.25 | 21 | 21.65 | |
| 2 | 21.05 | 22.80 | 12 | 20.65 | 22.20 | 22 | 21.80 | |
| 3 | —— | 22.35 | 13 | 20.90 | 21.95 | 23 | 22.25 | |
| 4 | 21.35 | —— | 14 | 21.00 | 22.00 | 24 | —— | |
| 5 | 21.15 | 22.75 | 15 | 21.15 | —— | 25 | 22.05 | |
| 6 | 20.85 | 22.85 | 16 | 21.00 | 21.60 | 26 | 22.50 | |
| 7 | 21.00 | 22.75 | 17 | —— | 21.50 | 27 | 21.65 | |
| 8 | 21.05 | —— | 18 | 21.25 | 21.70 | 28 | 23.00 | |
| 9 | 21.10 | 21.95 | 19 | 21.25 | 21.55 | 29 | 22.80 | |
| 10 | —— | 22.20 | 20 | 21.50 | 21.20 | 30 | 23.10 | |
| | | | | | | 31 | | |

### Average Monthly Price Per Pound

| Month | 1926 Cents | 1927 Cents | 1928 Cents | Month | 1926 Cents | 1927 Cents | 1928 Cents |
|---|---|---|---|---|---|---|---|
| Jan. | 20.85 | 13.42 | 19.12 | Aug. | 18.57 | 20.04 | |
| Feb. | 20.60 | 14.10 | 18.40 | Sept. | 17.02 | 21.95 | |
| Mar. | 19.35 | 14.32 | 19.38 | Oct. | 13.14 | 20.55 | |
| Apr. | 19.13 | 14.75 | 20.63 | Nov. | 12.86 | 20.22 | |
| May | 18.92 | 16.07 | 21.58 | Dec. | 12.68 | 19.58 | |
| June | 18.57 | 16.85 | 21.50 | Average for Year | 17.53 | 17.49 | |
| July | 18.71 | 18.00 | | | | | |

# Stock of Crude Rubber in the U. S.

*(All Quantities in Long Tons)*

| At | ON HAND | | | AFLOAT | | | ON HAND AND AFLOAT | | |
|---|---|---|---|---|---|---|---|---|---|
| End of | 1926 | 1927 | 1928 | 1926 | 1927 | 1928 | 1926 | 1927 | 1928 |
| Jan. | 55,198 | 76,172 | 110,244 | 46,296 | 45,312 | 41,256 | 100,434 | 121,484 | 151,500 |
| Feb. | 58,035 | 91,186 | 108,955 | 46,935 | 42,166 | 43,316 | 104,970 | 133,352 | 152,271 |
| March | 61,822 | 85,740 | 114,061 | 43,567 | 49,600 | 39,324 | 105,389 | 135,340 | 153,385 |
| April | 55,261 | 92,757 | 113,083 | 41,905 | 38,963 | 33,986 | 97,166 | 131,720 | 147,069 |
| May | 64,360 | 94,563 | 105,356 | 40,303 | 44,181 | 34,374 | 104,663 | 138,744 | 139,730 |
| June | 60,460 | 89,250 | 90,198 | 40,907 | 47,233 | 40,001 | 101,367 | 136,483 | 130,119 |
| July | 64,900 | 98,469 | | 38,062 | 40,587 | | 102,962 | 139,056 | |
| Aug. | 60,870 | 96,148 | | 37,360 | 40,937 | | 98,230 | 137,085 | |
| Sept. | 62,078 | 97,829 | | 42,464 | 37,966 | | 105,542 | 135,793 | |
| Oct. | 64,089 | 97,452 | | 52,930 | 42,804 | | 117,919 | 140,256 | |
| Nov. | 69,385 | 101,034 | | 47,311 | 37,076 | | 116,696 | 138,110 | |
| Dec. | 72,520 | 100,130 | | 52,020 | 47,938 | | 124,540 | 148,068 | |

**(Rubber Association of America figures raised to 100%.)**

# Stock of Crude Rubber in London

**(No. of tons in Wharves and Warehouses, including Latex)**

| At end of: | 1920 | 1921 | 1922 | 1923 | 1924 | 1925 | 1926 | 1927 | 1928 |
|---|---|---|---|---|---|---|---|---|---|
| Jan. | 19,300 | 56,573 | 67,252 | 73,498 | 57,460 | 27,172 | 9,994 | 54,994 | 66,524 |
| Feb. | 18,329 | 59,439 | 67,623 | 70,483 | 56,732 | 23,425 | 10,004 | 58,826 | 62,964 |
| Mar. | 18,969 | 63,913 | 66,670 | 63,438 | 55,647 | 18,104 | 13,127 | 63,055 | 58,272 |
| Apr. | 20,072 | 68,759 | 68,637 | 58,770 | 54,559 | 12,949 | 18,773 | 66,897 | 53,425 |
| May | 20,921 | 70,403 | 70,146 | 54,439 | 51,615 | 5,895 | 20,384 | 67,169 | |
| June | 22,517 | 69,408 | 71,597 | 51,050 | 51,115 | 5,318 | 23,984 | 63,902 | |
| July | 25,346 | 71,065 | 71,515 | 49,937 | 52,073 | 4,258 | 27,727 | 63,717 | |
| Aug. | 30,674 | 73,211 | 72,112 | 58,427 | 49,700 | 4,619 | 30,165 | 64,491 | |
| Sept. | 35,504 | 72,175 | 70,977 | 54,523 | 44,011 | 5,453 | 35,077 | 68,236 | |
| Oct. | 41,743 | 69,229 | 68,536 | 58,891 | 37,523 | 5,086 | 42,138 | 69,569 | |
| Nov. | 45,550 | 70,786 | 68,548 | 60,074 | 33,593 | 3,869 | 44,057 | 67,050 | |
| Dec. | 50,652 | 69,792 | 72,299 | 60,246 | 29,488 | 5,697 | 48,918 | 63,793 | |

### At End of Recent Weeks

| | First Saturday | Second Saturday | Third Saturday | Fourth Saturday | Fifth Saturday |
|---|---|---|---|---|---|
| 1927 | | | | | |
| August | 64,177 | 64,557 | 64,842 | 64,259 | —— |
| September | 65,162 | 66,148 | 66,664 | 67,253 | —— |
| October | 68,519 | 70,167 | 70,916 | 70,060 | 69,551 |
| November | 69,660 | 69,501 | 69,850 | 67,318 | —— |
| December | 65,869 | 66,011 | 64,761 | 63,397 | 63,207 |
| 1928 | | | | | |
| January | 64,360 | 65,524 | 65,450 | 66,285 | —— |
| February | 65,909 | 64,945 | 63,769 | 63,103 | —— |
| March | 61,978 | 61,920 | 61,033 | 59,644 | 58,197 |
| April | 58,732 | 58,945 | 56,819 | 53,360 | —— |
| May | 52,015 | 50,837 | 48,705 | 44,628 | —— |
| June | 43,716 | 42,683 | 41,185 | 40,083 | 38,611 |
| July | 36,915 | 35,925 | | | |

# Rubber in Singapore and Penang

*(Stocks held by Dealers—Quantities in Long Tons)*

| End of | 1926 | 1927 | 1928 | End of | 1926 | 1927 | 1928 |
|---|---|---|---|---|---|---|---|
| Jan. | 16,726 | 25,440 | 25,868 | July | 23,101 | 22,558 | |
| Feb. | 13,653 | 26,766 | 22,867 | Aug. | 23,362 | 25,764 | |
| Mar. | 18,389 | 27,844 | 20,538 | Sept. | 25,997 | 25,178 | |
| Apr. | 16,328 | 24,543 | 16,946 | Oct. | 26,614 | 25,790 | |
| May | 16,967 | 25,133 | 17,437 | Nov. | 25,486 | 28,369 | |
| June | 19,416 | 21,898 | 18,207 | Dec. | 26,443 | 25,798 | |

# Rims Inspected and Passed in U. S.

*(Tire and Rim Association Reports)*

| | Total | Per Cent Balloons | | Total | Per Cent Balloons |
|---|---|---|---|---|---|
| 1922 | 16,297,735 | 0.0 | 1925 | 26,001,664 | 66.8 |
| 1923 | 23,140,620 | 0.6 | 1926 | 24,199,524 | 78.8 |
| 1924 | 21,863,311 | 19.7 | 1927 | 19,700,003 | 79.1 |
| 1927 | | | 1928 | | |
| July | 1,679,587 | 84.4 | January | 1,811,534 | 87.8 |
| August | 1,825,905 | 80.2 | February | 1,806,437 | 86.5 |
| September | 1,727,122 | 77.7 | March | 2,420,084 | 86.4 |
| October | 1,354,924 | 81.4 | April | 2,316,324 | 88.4 |
| November | 838,591 | 67.8 | May | 2,185,592 | 84.0 |
| December | 1,134,421 | 80.0 | June | 2,429,453 | 83.1 |

# U. S. Consumption of Gasoline

*(In Barrels of 42 Gallons)*

| MONTHS | 1924 | 1925 | 1926 | 1927 | 1928 |
|---|---|---|---|---|---|
| January | 11,918,000 | 14,386,000 | 17,582,000 | 17,888,000 | 20,939,000 |
| February | 9,626,000 | 13,210,000 | 15,814,000 | 18,240,000 | 21,136,000 |
| March | 10,961,000 | 14,890,000 | 19,302,000 | 22,464,000 | 24,041,000 |
| April | 14,583,000 | 19,013,000 | 20,848,000 | 23,371,000 | 25,712,000 |
| May | 15,889,000 | 20,459,000 | 24,213,000 | 26,579,000 | 27,355,000 |
| June | 16,421,000 | 20,724,000 | 23,803,000 | 27,799,000 | |
| July | 18,610,000 | 22,879,000 | 24,752,000 | 29,784,000 | |
| August | 19,825,000 | 22,323,000 | 26,912,000 | 29,779,000 | |
| September | 16,871,000 | 20,177,000 | 22,929,000 | 28,409,000 | |
| October | 18,029,000 | 19,826,000 | 23,973,000 | 25,497,000 | |
| November | 16,607,000 | 18,024,000 | 20,618,000 | 24,400,000 | |
| December | 15,663,000 | 17,954,000 | 21,419,000 | 23,718,000 | |
| TOTAL | 185,003,000 | 223,865,000 | 262,165,000 | 297,928,000 | |

# U. S. Tire and Tube Statistics

*(All Figures Represent Thousands)*

## AUTOMOBILE CASINGS

### Figures for Recent Years

| | 1922 | 1923 | 1924 | 1925 | 1926 | 1927 |
|---|---|---|---|---|---|---|
| Production | 40,932 | 45,259 | 51,633 | 60,845 | 61,237 | 64,439 |
| Shipments | 39,987 | 45,204 | 50,120 | 59,262 | 59,002 | 64,059 |
| Inventory[2] | 6,132 | 5,772 | 7,427 | 8,142 | 10,456 | 10,264 |

### Figures for Recent Months

| | PRODUCTION | | | SHIPMENTS | | | INVENTORY | | |
|---|---|---|---|---|---|---|---|---|---|
| | 1926 | 1927 | 1928 | 1926 | 1927 | 1928 | 1926 | 1927 | 1928 |
| Jan. | 4,587 | 4,965 | 5,491 | 2,974 | 4,932 | 5,394 | 9,947 | 10,432 | 9,949 |
| Feb. | 4,865 | 5,095 | 6,363 | 3,436 | 4,458 | 5,031 | 11,164 | 11,075 | 11,721 |
| Mar. | 5,456 | 6,276 | 6,819 | 4,561 | 5,701 | 5,731 | 12,004 | 11,583 | 12,389 |
| Apr. | 5,346 | 6,299 | 6,178 | 4,980 | 5,701 | 5,812 | 12,461 | 12,122 | 12,717 |
| May | 5,023 | 6,151 | 6,759 | 5,211 | 5,657 | 6,457 | 12,343 | 12,462 | 13,024 |
| June | 5,422 | 6,202 | | 5,724 | 6,253 | | 11,968 | 12,462 | |
| July | 4,950 | 5,087 | | 6,337 | 5,973 | | 10,592 | 11,326 | |
| Aug. | 5,872 | 5,752 | | 6,744 | 6,393 | | 9,732 | 10,721 | |
| Sept. | 5,706 | 4,822 | | 6,040 | 5,717 | | 9,318 | 9,722 | |
| Oct. | 5,103 | 4,773 | | 4,544 | 4,799 | | 9,917 | 9,665 | |
| Nov. | 4,324 | 4,502 | | 3,733 | 4,306 | | 10,297 | 10,136 | |
| Dec. | 4,683 | 4,497 | | 4,718 | 4,165 | | 10,456 | 10,264 | |

## AUTOMOBILE INNER TUBES

### Figures for Recent Years

| | 1922 | 1923 | 1924 | 1925 | 1926 | 1927 |
|---|---|---|---|---|---|---|
| Production | 50,850 | 60,116 | 70,706 | 82,614 | 76,618 | 70,823 |
| Shipments | 49,673 | 59,072 | 68,016 | 81,004 | 71,591 | 72,896 |
| Inventory[2] | 7,643 | 8,425 | 11,052 | 11,313 | 16,200 | 13,692 |

### Figures for Recent Months

| | PRODUCTION | | | SHIPMENTS | | | INVENTORY | | |
|---|---|---|---|---|---|---|---|---|---|
| | 1926 | 1927 | 1928 | 1926 | 1927 | 1928 | 1926 | 1927 | 1928 |
| Jan. | 6,809 | 5,337 | 5,441 | 3,723 | 6,016 | 6,072 | 14,361 | 15,585 | 12,982 |
| Feb. | 6,825 | 5,658 | 6,895 | 3,736 | 5,120 | 5,431 | 17,090 | 16,075 | 14,650 |
| Mar. | 7,030 | 7,184 | 6,231 | 4,987 | 6,157 | 5,731 | 19,131 | 17,096 | 15,573 |
| Apr. | 6,554 | 7,373 | 6,661 | 5,051 | 6,359 | 5,702 | 20,674 | 17,801 | 16,638 |
| May | 6,149 | 6,737 | 7,168 | 6,304 | 6,140 | 6,300 | 21,141 | 18,389 | 17,702 |
| June | 6,171 | 6,306 | | 6,898 | 6,832 | | 20,243 | 17,858 | |
| July | 5,729 | 5,284 | | 8,569 | 7,070 | | 17,267 | 16,004 | |
| Aug. | ,424 | 6,480 | | 9,579 | 7,983 | | 15,462 | 14,664 | |
| Sept. | 7,590 | 5,651 | | 7,762 | 6,758 | | 15,312 | 13,511 | |
| Oct. | 6,208 | 5,065 | | 5,474 | 5,024 | | 15,929 | 13,539 | |
| Nov. | 4,852 | 4,775 | | 4,045 | 4,723 | | 16,604 | 13,585 | |
| Dec. | 5,277 | 4,969 | | 5,463 | 4,712 | | 16,200 | 13,692 | |

(1) Rubber Association of America figures, raised to 100%. The Association estimates its figures to be 75% representative or complete when issued and that basis has been accepted when preparing the statistics in this table.

(2) Held by manufacturers at end of period indicated.

# Automobile Production

| | United States | | | Canada | | | |
|---|---|---|---|---|---|---|---|
| | Total | Passenger Cars | Trucks | Total | Passenger Cars | Trucks | Grand Total |
| 1921 | 1,595,304 | 1,452,902 | 142,402 | 66,246 | 61,098 | 5,148 | 1,661,550 |
| 1922 | 2,547,208 | 2,302,923 | 244,285 | 102,053 | 94,904 | 7,149 | 2,649,261 |
| 1923 | 4,020,255 | 3,631,728 | 388,527 | 146,438 | 129,228 | 17,210 | 4,166,693 |
| 1924 | 3,600,918 | 3,203,049 | 397,869 | 135,246 | 117,765 | 17,481 | 3,736,164 |
| 1925 | 4,265,704 | 3,760,459 | 505,245 | 161,389 | 139,311 | 22,078 | 4,427,093 |
| 1926 | 4,298,799 | 3,808,753 | 490,046 | 205,092 | 164,483 | 40,609 | 4,503,891 |
| 1927 | | | | | | | |
| Jan. | 238,926 | 199,650 | 39,276 | 15,376 | 11,745 | 3,631 | 254,302 |
| Feb. | 304,758 | 264,171 | 40,587 | 18,655 | 14,826 | 3,829 | 323,413 |
| March | 394,430 | 345,911 | 48,519 | 23,250 | 19,723 | 3,527 | 417,680 |
| April | 404,743 | 357,009 | 47,734 | 24,611 | 20,890 | 3,721 | 429,354 |
| May | 404,099 | 357,148 | 46,951 | 25,708 | 21,991 | 3,717 | 429,807 |
| June | 321,959 | 278,728 | 43,231 | 19,208 | 16,470 | 2,738 | 341,167 |
| July | 268,474 | 236,866 | 31,608 | 10,987 | 8,719 | 2,268 | 279,461 |
| Aug. | 308,807 | 274,378 | 34,429 | 12,526 | 10,139 | 2,387 | 321,333 |
| Sept. | 260,420 | 226,440 | 33,980 | 11,262 | 8,681 | 2,581 | 271,682 |
| Oct. | 219,712 | 183,041 | 36,671 | 7,791 | 6,236 | 1,555 | 227,503 |
| Nov. | 134,381 | 109,742 | 24,639 | 6,617 | 5,173 | 1,444 | 140,998 |
| Dec. | 133,178 | 105,784 | 27,394 | 3,435 | 2,277 | 1,158 | 136,613 |
| TOTAL | 3,393,887 | 2,938,868 | 453,019 | 179,426 | 146,870 | 32,556 | 3,573,313 |
| 1928 | | | | | | | |
| Jan. | 225,039 | 199,032 | 26,007 | 8,463 | 6,705 | 1,758 | 282,502 |
| Feb. | 323,368 | 290,830 | 32,358 | 12,504 | 10,315 | 2,189 | 335,872 |
| March | 412,825 | 371,408 | 41,417 | 9,724 | 7,478 | 2,246 | 422,549 |
| April | 409,948 | 364,877 | 45,071 | 24,240 | 20,546 | 3,694 | 434,188 |
| May | 425,990 | 375,798 | 50,192 | 33,942 | 29,764 | 4,178 | 459,932 |
| June | 321,967 | 278,729 | 43,238 | 19,208 | 16,470 | 2,738 | 341,175 |
| July | | | | | | | |
| Aug. | | | | | | | |
| Sept. | | | | | | | |
| Oct. | | | | | | | |
| Nov. | | | | | | | |
| Dec. | | | | | | | |

# Exports of Crude Rubber from Principal Producing Countries

(*Long Tons*)

| | BRITISH MALAYA[1] | | | | | | | | DUTCH EAST INDIES[2] | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Gross Exports | Imports | Gross Exports Minus Imports | Ceylon[3] | India & Burma[3] | Sarawak[4] | British North Borneo[3] | Siam[4] | Java & Madura | Sumatra E. Coast | Other D.E.I. | Indo-China[5] | Amazon Valley | All Other[6] | World Total[7] |
| 1923 | 252,016 | 70,432 | 181,584 | 39,971 | 6,416 | 5,705 | 4,237 | 1,718 | 32,930 | 46,344 | 57,822 | 5,067 | 16,765 | 7,856 | 406,955 |
| 1924 | 259,706 | 108,524 | 151,182 | 39,997 | 7,697 | 6,699 | 4,621 | 2,962 | 42,446 | 54,497 | 80,347 | 6,688 | 23,165 | 9,065 | 429,366 |
| 1925 | 316,825 | 158,022 | 158,803 | 49,566 | 10,082 | 5,424 | 5,377 | 5,377 | 46,757 | 65,499 | 120,626 | 7,881 | 25,298 | 13,797 | 517,523 |
| 1926 | 391,328 | 151,243 | 240,085 | 58,962 | 9,874 | 9,155 | 6,079 | 4,027 | 52,186 | 71,413 | 121,231 | 8,203 | 24,298 | 16,017 | 621,530 |
| 1927 | 371,322 | 182,845 | 188,477 | 55,356 | 11,321 | 10,923 | 6,582 | 5,472 | 55,297 | 77,815 | 142,171 | 8,645 | 28,782 | 15,633 | 606,474 |
| **1926:** | | | | | | | | | | | | | | | |
| **Apr.** | **23,727** | **10,565** | **13,162** | **3,766** | **590** | **679** | **374** | **293** | **4,226** | **4,598** | **6,285** | **410** | **2,318** | **1,529** | **38,230** |
| **May** | **31,231** | **10,604** | **20,627** | **3,944** | **691** | **927** | **410** | **279** | **4,440** | **5,358** | **8,737** | **502** | **1,353** | **1,464** | **48,732** |
| **June** | **30,624** | **11,764** | **18,860** | **4,208** | **452** | **779** | **512** | **275** | **4,444** | **6,125** | **10,614** | **549** | **1,213** | **1,279** | **49,310** |
| July | 28,824 | 15,280 | 13,544 | 4,422 | 938 | 911 | 498 | 439 | 4,618 | 5,612 | 13,112 | 1,521 | 1,565 | 1,148 | 48,328 |
| Aug. | 34,625 | 13,595 | 21,030 | 5,666 | 521 | 890 | 476 | 316 | 4,132 | 5,699 | 10,390 | 378 | 1,888 | 1,097 | 52,483 |
| Sept. | 35,913 | 13,972 | 21,941 | 6,015 | 651 | 888 | 689 | 457 | 4,065 | 6,568 | 11,391 | 681 | 2,156 | 822 | 56,324 |
| Oct. | 39,867 | 15,203 | 24,164 | 5,672 | 634 | 805 | 473 | 385 | 4,058 | 6,998 | 11,491 | 661 | 1,904 | 1,023 | 58,268 |
| Nov. | 34,302 | 12,201 | 22,101 | 4,228 | 1,110 | 685 | 547 | 285 | 3,988 | 5,816 | 9,422 | 718 | 1,911 | 1,259 | 52,070 |
| Dec. | 36,811 | 14,716 | 22,095 | 6,498 | 1,176 | 895 | 617 | 338 | 5,054 | 7,117 | 12,786 | 790 | 3,821 | 714 | 61,901 |
| **1927:** | | | | | | | | | | | | | | | |
| Jan. | 34,946 | 14,995 | 19,951 | 6,697 | 921 | 959 | 585 | 304 | 4,187 | 6,706 | 10,690 | 941 | 3,482 | 981 | 56,404 |
| Feb. | 27,528 | 11,697 | 15,831 | 3,571 | 1,469 | 552 | 445 | 360 | 4,078 | 6,526 | 10,535 | 675 | 2,104 | 1,098 | 47,244 |
| Mar. | 41,346 | 17,464 | 23,882 | 7,142 | 1,124 | 997 | 639 | 432 | 5,657 | 7,004 | 12,905 | 733 | 3,178 | 1,791 | 65,484 |
| Apr. | 29,041 | 13,069 | 15,972 | 3,349 | 723 | 984 | 452 | 526 | 4,666 | 5,531 | 10,197 | 557 | 2,451 | 1,520 | 46,928 |
| May | 31,393 | 15,491 | 15,902 | 3,124 | 760 | 786 | 415 | 348 | 5,430 | 5,529 | 13,410 | 586 | 2,460 | 1,207 | 49,957 |
| June | 32,607 | 14,706 | 17,901 | 3,348 | 856 | 1,100 | 539 | 409 | 4,818 | 5,518 | 9,109 | 772 | 889 | 1,731 | 46,990 |
| July | 23,947 | 12,697 | 11,250 | 4,018 | 827 | 859 | 544 | 333 | 4,771 | 6,142 | 11,566 | 519 | 1,757 | 1,113 | 43,699 |
| Aug. | 30,371 | 17,105 | 13,266 | 5,357 | 688 | 1,133 | 623 | 546 | 4,355 | 6,682 | 12,440 | 716 | 1,928 | 969 | 48,703 |
| Sept. | 29,835 | 12,095 | 17,740 | 4,911 | 479 | 645 | 566 | 498 | 3,635 | 5,957 | 9,853 | 497 | 2,072 | 1,213 | 48,066 |
| Oct. | 29,846 | 15,801 | 14,045 | 5,245 | 802 | 721 | 591 | 542 | 3,810 | 7,755 | 13,633 | 775 | 2,752 | 939 | 51,520 |
| Nov. | 28,277 | 19,860 | 8,417 | 4,464 | 1,277 | 1,241 | 591 | 600 | 4,127 | 6,587 | 14,395 | 683 | 2,369 | 1,627 | 46,378 |
| Dec. | 32,185 | 17,865 | 14,320 | 4,130 | 1,395 | 946 | 592 | 664 | 5,763 | 7,878 | 13,438 | 1,191 | 3,340 | 1,444 | 55,101 |
| **1928:** | | | | | | | | | | | | | | | |
| Jan. | 27,731 | 16,618 | 11,113 | 4,352 | 1,605 | 842 | 500* | 525 | 4,851 | 7,988 | 11,360 | 720 | 2,273 | 1,025 | 47,154 |
| Feb. | 28,813 | 12,911 | 15,902 | 4,353 | 1,081 | 667 | 500* | 536 | 4,052 | 6,757 | 8,635 | 723 | 1,612 | 1,276 | 46,094* |
| Mar. | 27,813 | 10,508 | 17,305 | 3,460 | 775 | 645 | 500* | 269 | 3,999 | 5,826 | 9,690 | 613 | 2,750 | 1,211 | 47,043* |
| Apr. | 20,029 | 9,335 | 10,694 | 3,460 | 789 | 630 | 500* | 258 | 3,993 | 5,040 | 5,538 | 518 | 1,014 | 1,200* | 33,634* |
| May | 26,403 | 10,350 | 16,053 | 3,125 | 654 | 842 | 500* | 241 | 4,943 | 5,355 | 10,382 | 619 | 2,062 | 1,200* | 45,976* |
| June | 22,980 | 16,168 | 6,762 | 3,125 | | 926 | 500* | 451 | | | | 902 | 1,399 | | |

(1) Mayalan net exports cannot be taken as production, since imported rubber is largely wet native rubber, which is reduced about one-third in weight by remilling; rubber exported as latex is not included which on a basis of 3½ pounds per gallon amounted to 115 tons in 1923, 1,117 in 1924, 3,618 in 1925, 3,263 in 1926, and 2,439 in 1927. (2) Ceylon Chamber of Commerce statistics until 1926; rubber exported as latex is not included—such shipments were equivalent to 18 tons in 1925, 93 tons 1924, 6 tons 1925, 20 tons in 1926, and about ½ ton in 1927. (3) Official statistics. (4) Imports into Singapore and Penang. (5) Exports from "Other D.E.I" are chiefly wet native rubber, which is reduced about one-third in weight by remilling; rubber exported as latex is not included which on a basis of 3½ pounds per gallon amounted to 2,342 tons in 1923, 1,008 tons 1924, 2,239 tons 1925, 44 tons in 1926, and 84 tons in 1927. (6) Calculated from official import statistics of principal consuming countries, viz., United States, United Kingdom, France, Germany, Belgium and Netherlands. This figure includes guayule rubber. (7) This total includes the third column for British Malaya, "Gross Exports minus Imports." and all the figures shown for the other territories. *Figure is provisional; final figure will be shown immediately it becomes available.

# Net Imports of Crude Rubber into Principal Manufacturing Countries

(*Long Tons*)

| | United States* | United Kingdom | France (h) | Germany | Canada (ac) | Japan (ac) | Italy | Russia (ce) | Australia (cd) | Belgium (d) | Netherlands | Scandinavia (abcdf) | Spain (g) | Czechoslovakia (abed) | World Total |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1919 | 236,977 | 42,671 | 17,685 | 5,584 | 6,395 | 9,753 | 9,894 | 75 | 1,002 | 3,995 | 2,771 | 3,149 | 2,418 | 9 | 342,378 |
| 1920 | 248,762 | 56,844 | 13,885 | 11,890 | 11,746 | 5,297 | 6,123 | 62 | 1,815 | 3,840 | 5,510 | 2,292 | 2,008 | 567 | 370,641 |
| 1921 | 179,678 | 42,087 | 15,185 | 21,920 | 8,124 | 21,713 | 3,906 | 165 | 1,014 | 1,705 | 1,022 | 1,279 | 2,245 | 569 | 300,562 |
| 1922 | 296,267 | 11,724 | 24,352 | 27,546 | 9,207 | 15,934 | 6,430 | 2,493 | 2,643 | 172 | -3,807 | 1,778 | 589 | 567 | 395,885 |
| 1923 | 300,372 | 12,700 | 27,392 | 18,519 | 13,277 | 15,372 | 8,489 | 2,986 | 1,649 | 2,184 | 792 | 2,528 | 630 | 1,128 | 408,018 |
| 1924 | 317,747 | -11,550 | 30,446 | 22,727 | 14,299 | 19,571 | 8,764 | 2,346 | 3,124 | 2,688 | -807 | 3,178 | 944 | 1,370 | 414,847 |
| 1925 | 381,815 | 4,061 | 32,956 | 33,937 | 19,683 | 11,117 | 11,412 | 7,088 | 4,757 | 2,930 | 875 | 3,149 | 1,155 | 1,558 | 516,493 |
| 1926 | 395,667 | 84,865 | 34,240 | 22,775 | 20,2[illegible] | 18,125 | 9,809 | 6,529 | 9,021 | 2,498 | 2,670 | 4,046 | 1,299 | 1,870 | 613,643 |
| **1926:** | | | | | | | | | | | | | | | |
| April | 33,416 | 8,275 | 4,121 | 1,781 | 1,615 | 1,868 | 865 | 402 | 505 | 71 | 93 | 335 | 130 | 193 | 53,670 |
| May | 28,705 | 6,773 | 2,519 | 1,848 | 1,239 | 1,010 | 705 | 200 | 468 | 186 | 241 | 225 | 60 | 192 | 44,871 |
| June | 23,795 | 5,894 | 2,196 | 1,655 | 1,188 | 1,465 | 1,070 | 983 | 636 | 269 | 215 | 303 | 123 | 103 | 39,895 |
| July | 34,266 | 6,768 | 2,352 | 2,202 | 1,552 | 1,447 | 800 | 132 | 702 | 295 | 480 | 292 | 121 | 115 | 51,524 |
| August | 26,081 | 7,327 | 2,457 | 2,110 | 1,888 | 1,284 | 796 | 655 | 1,275 | 303 | 594 | 336 | 90 | 151 | 45,347 |
| September | 35,675 | 8,848 | 1,774 | 2,029 | 1,355 | 1,922 | 819 | 472 | 1,241 | 283 | 429 | 317 | 91 | 138 | 55,388 |
| October | 28,110 | 8,082 | 3,376 | 2,423 | 1,865 | 2,396 | 645 | 585 | 1,004 | 301 | 2 | 360 | 100 | 121 | 49,370 |
| November | 37,673 | 9,247 | 2,719 | 3,007 | 1,548 | 3,380 | 832 | 568 | 916 | 194 | -18 | 358 | 90 | 181 | 60,695 |
| December | 35,850 | 4,749 | 2,890 | 2,562 | 1,847 | 856 | 439 | 725 | 777 | 248 | 156 | 443 | 151 | 306 | 51,999 |
| **1927:** | | | | | | | | | | | | | | | |
| January | 41,815 | 10,192 | 3,284 | 2,481 | 1,936 | 1,227 | 672 | 803 | 929 | 296 | 192 | 316 | 139 | 100 | 64,382 |
| February | 25,886 | 7,692 | 3,263 | 3,103 | 2,620 | 1,902 | 601 | 907 | 460 | 502 | 152 | 336 | 146 | 210 | 47,780 |
| March | 32,752 | 9,049 | 2,050 | 3,475 | 3,760 | 1,578 | 852 | 784 | 780 | 454 | 86 | 385 | 137 | 127 | 56,269 |
| April | 44,627 | 7,875 | 2,810 | 2,393 | 1,509 | 2,181 | 781 | 1,972 | 762 | 448 | 58 | 230 | 177 | 218 | 65,541 |
| May | 33,736 | 2,896 | 2,006 | 3,380 | 2,519 | 1,084 | 918 | 887 | 694 | 626 | -57 | 335 | 155 | 223 | 49,402 |
| June | 31,270 | 2,282 | 2,387 | 3,632 | 2,086 | 798 | 942 | 1,506 | 557 | 583 | -17 | 243 | 164 | 183 | 46,616 |
| July | 35,719 | 1,116 | 2,384 | 2,899 | 2,104 | 1,505 | 1,007 | 415 | 900 | 429 | 66 | 227 | 177 | 236 | 49,184 |
| August | 31,001 | 3,463 | 2,795 | 3,119 | 2,013 | 1,970 | 1,274 | 386 | 650 | 604 | -63 | 312 | 138 | 123 | 47,785 |
| September | 29,801 | 7,800 | 1,956 | 2,891 | 1,850 | 2,025 | 684 | 518 | 772 | 552 | -33 | 451 | 155 | 272 | 49,694 |
| October | 27,671 | 5,888 | 3,479 | 4,202 | 1,790 | 1,966 | 1,021 | 1,075 | 908 | 465 | 156 | 401 | 153 | 363 | 49,538 |
| November | 36,128 | 1,687 | 3,661 | 4,209 | 1,916 | 1,575 | 1,167 | 1,312 | 836 | 749 | 298 | 474 | 246 | 317 | 54,570 |
| December | 28,082 | 309 | 4,696 | 3,108 | 2,302 | 2,710 | 1,462 | 1,453 | 1,242 | 784 | -202 | 514 | 268 | 300 | 47,028 |
| | 398,483 | 60,249 | 34,271 | 38,892 | 26,405 | 20,521 | 11,381 | 12,018 | 9,490 | 6,492 | 636 | 4,224 | 2,055 | 2,672 | 627,789 |
| **1928:** | | | | | | | | | | | | | | | |
| Jan. | 37,120 | 1,921 | 1,764 | 2,485 | 2,290 | 1,361 | 760 | 995 | 802 | 589 | 52 | 261 | 335 | 376 | 51,111 |
| Feb. | 30,926 | 3,143 | 2,526 | 2,984 | 2,553 | 1,258 | 437 | 159 | 616 | 599 | 98 | 307 | 296 | 297 | 46,199 |
| Mar. | **36,970** | **3,179** | **1,902** | **3,521** | 2,989 | 1,707 | 763 | 1,468 | 918 | 816 | 95 | 351 | 497 | 398 | 55,574 |
| April | 35,686 | —2,280 | 2,204 | 2,719 | 1,938 | 2,353 | 1,115 | 926 | 832 | 575 | 280 | 339 | 304 | 159 | 47,150 |
| May | 28,659 | —5,323 | | 2,944 | 2,180 | | | 744 | 655 | 746 | 209 | | | | |

a—Including gutta percha. b—Including balata. c—Re-exports not deducted in monthly statistics. d—Including some scrap and reclaimed rubber. e—German, United Kingdom, and United States exports to Russia. f—Including Norway, Sweden, Denmark and Finland. g—United Kingdom and French exports to Spain except in years prior to 1925. h—French imports have been reduced 12 per cent in order to eliminate imports of gutta percha and to reduce to basis of net weight. *United States imports of guayule are not included in this compilation; such imports amounted to 4,305 tons in 1926 and to 5,019 tons in 1927.

# BOOK REVIEWS

THE COLLOID CHEMISTRY OF THE RUBBER INDUSTRY. By E. A. Hauser, Professor of Colloid Chemistry at the Massachusetts Institute of Technology, Cambridge, U. S. A. Oxford University Press, London and New York. 1928. 56 pp.

The book forms a permanent record of the first series of Gow Lectures on the colloid chemistry of the rubber industry, which were delivered by Dr. Hauser at University College, London, between November 7 and 18, 1927. It contains the six lectures under the same headings as they were delivered, but rewritten suitably for publication in book form, with all necessary references.

Dr. Hauser is well known in rubber scientific circles for his thoroughness of treatment of a subject and these scholarly lectures have proved a valuable contribution to rubber literature. They cover also a general survey of the work already done in the field of colloid chemistry of the rubber industry and point out those fields where the continuation of this work would be of the greatest value and importance. The research in this general field so far has opened many entirely new and startling facts which have brought about considerable change in the interpretation of colloidal matter. Dr. Hauser has been a pioneer worker in this research and one to whom the principal advances are due.

GASTEX—Carbon Black. Published by the Grasselli Chemical Company, Rubber Service Department, New York and Cleveland. 1928. 16 pp.

The booklet covers a complete description of this new type of carbon black, manufactured by the General Atlas Chemical Company, Pampa, Texas, owned and controlled by Henry L. Doherty & Company, New York City, but sold exclusively through the Grasselli Chemical Company. The pamphlet lists the properties of the new product and gives various tables showing its performances with various compounds.

## United States Imports of Guayule Rubber and Related Gums

*(All quantities in Long Tons)*

| | Guayule | | Balata | | Jelutong | | Gutta Percha | |
|---|---|---|---|---|---|---|---|---|
| | Tons | Dollars | Tons | Dollars | Tons | Dollars | Tons | Dollars |
| 1919 | 1,430 | 760,690 | 727 | 937,038 | 8,332 | 2,213,964 | 2,900 | 1,068,698 |
| 1920 | 758 | 345,985 | 1,064 | 1,260,043 | 5,672 | 2,068,501 | 3,183 | 1,520,309 |
| 1921 | 58 | 26,945 | 814 | 1,077,859 | 1,745 | 351,893 | 985 | 333,564 |
| 1922 | 127 | 57,040 | 812 | 978,765 | 2,335 | 403,812 | 818 | 281,012 |
| 1923 | 1,155 | 542,227 | 700 | 898,524 | 4,565 | 853,308 | 912 | 375,167 |
| 1924 | 1,356 | 536,392 | 464 | 568,456 | 6,165 | 1,237,100 | 1,408 | 463,610 |
| 1925 | 3,781 | 1,803,448 | 517 | 574,750 | 6,749 | 1,642,531 | 1,603 | 629,284 |
| 1926 | 4,305 | 2,562,096 | 354 | 327,213 | 7,263 | 3,127,757 | 1,445 | 661,156 |
| 1927 | 5,018 | 2,674,957 | 582 | 447,246 | 7,785 | 2,448,657 | 1,494 | 728,172 |
| 1928: | | | | | | | | |
| Jan. | 432 | 242,339 | 27 | 24,218 | 588 | 183,705 | 150 | 86,702 |
| Feb. | 489 | 281,295 | 33 | 32,165 | 403 | 142,621 | 312 | 215,085 |
| Mar. | 575 | 365,927 | 32 | 26,460 | 829 | 388,616 | 115 | 57,833 |
| Apr. | 512 | 312,131 | 47 | 32,924 | 592 | 174,970 | 68 | 27,627 |
| May | 452 | 233,414 | — | — | 679 | 226,064 | 100 | 42,762 |
| June | 424 | 220,081 | 9 | 6,799 | 293 | 91,152 | 28 | 12,374 |

## Reclaimed Rubber in the United States

*(All Quantities in Long Tons—100% Basis)*

| | | Consumption | | | | | Consumption | | |
|---|---|---|---|---|---|---|---|---|---|
| | Produc- | | % to | | | Produc- | | % to | |
| Year | tion | Tons | Crude | Stocks* | Year | tion | Tons | Crude | Stocks* |
| 1919 | 81,366 | 73,535 | 36.3 | ..... | 1924 | 80,079 | 76,072 | 22.4 | ..... |
| 1920 | 86,395 | 75,297 | 38.4 | ..... | 1925 | 132,930 | 137,105 | 35.6 | 13,203 |
| 1921 | 36,725 | 41,351 | 24.1 | ..... | 1926 | 180,582 | 164,500 | 45.9 | 23,218 |
| 1922 | 57,834 | 54,458 | 19.3 | ..... | 1927 | 189,144 | 178,471 | 47.6 | 24,980 |
| 1923 | 74,766 | 69,534 | 22.7 | ..... | | | | | |
| 1927: | | | | | | | | | |
| Jan. | 16,526 | 12,374 | 39.3 | 25,903 | July | 15,488 | 13,842 | 47.4 | 26,599 |
| Feb. | 15,860 | 14,424 | 47.8 | 27,291 | Aug. | 15,109 | 15,836 | 47.3 | 25,157 |
| Mar. | 16,788 | 13,528 | 37.4 | 27,124 | Sept. | 14,392 | 14,790 | 54.3 | 23,429 |
| Apr. | 14,488 | 16,677 | 46.5 | 25,712 | Oct. | 16,127 | 17,292 | 64.5 | 22,176 |
| May | 16,159 | 15,754 | 46.1 | 26,419 | Nov. | 15,477 | 14,876 | 55.5 | 21,728 |
| June | 16,652 | 15,547 | 46.0 | 25,811 | Dec. | 16,083 | 13,431 | 52.7 | 24,980 |
| 1928: | | | | | | | | | |
| Jan. | 14,862 | 18,134 | 52.7 | 21,941 | July | | | | |
| Feb. | 15,291 | 16,808 | 49.9 | 20,848 | Aug. | | | | |
| Mar. | 17,069 | 18,619 | 52.2 | 19,558 | Sept. | | | | |
| Apr. | 15,393 | 17,355 | 52.9 | 19,283 | Oct. | | | | |
| May | | | | | Nov. | | | | |
| June | | | | | Dec. | | | | |

*Stocks on hand at the end of month or year. Exports of reclaimed rubber, not shown in this table, amounted to 8,540 tons in 1927.

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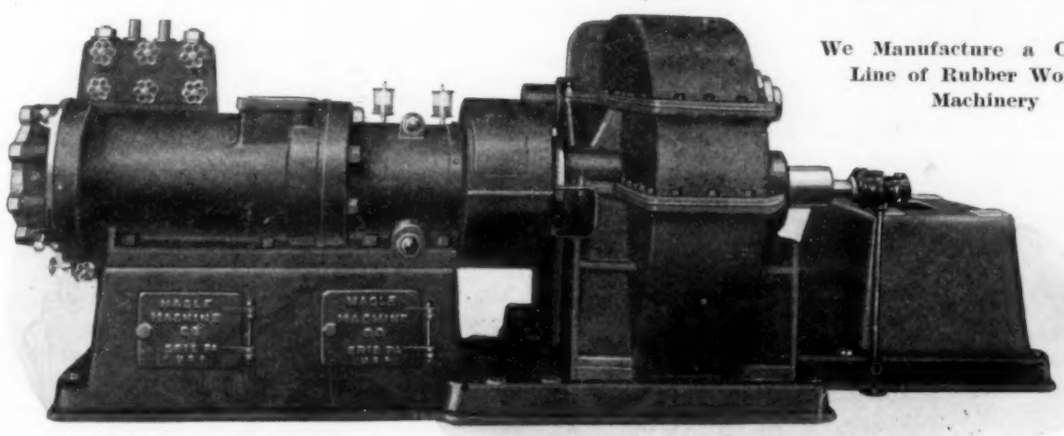

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